CRPL-F66

IONOSPHERIC DATA

ISSUED
FEBRUARY 1950

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
WASHINGTON, D. C.

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27 Feb.1950

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CONTENTS

SYMBOLS AND TERMINOLOGY; CONVENTIONS FOR DETERMINING MEDIAN VALUES

Beginning with data reported for January 1949, the symbols, terminology, and conventions for the determination of median values used in this report (CRPL-F series) conform as far as practicable to those adopted at the Fifth Meeting of the International Radio Consultative Committee (C.C.I.R.) in Stockholm, 1948, and given in detail on pages 2 to 10 of the report CRPL-F53, "Ionospheric Data," issued January 1949.

For symbols and terminology used with data prior to January 1949, see report IRPL-C61, "Report of International Radio Propagation Conference, Washington, 17 April to 5 May, 1944," previous issues of the F series, in particular, IRPL-F5, CRPL-F24, F33, F50, and report CRPL-7-1, "Preliminary Instructions for Obtaining and Reducing Manual Ionospheric Records."

Following the recommendations of the Washington (1944) and Stockholm (1948) conferences, beginning with data for January 1945, median values are published wherever possible. Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

In addition to the conventions for the determination of medians given in Appendix 5 of Document No. 293 E of the Stockholm conference, which are listed on pages 9 and 10 of CRPL-F53, the following conventions are used in determining the medians for hours when no measured values are given because of equipment limitations and ionospheric irregularities. Symbols used are those given on pages 2-9 of CRPL-F53 (Appendixes 1-4 of Document No. 293 E referred to above).

a. For all ionospheric characteristics:

Values missing because of A, B, C, F, L, M, N, Q, R, S, or T (see terminology referred to above) are omitted from the median count.

b. For critical frequencies and virtual heights:

Values of foF2 (and foE near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of h'F2 (and h'E near sunrise and sunset) missing for this reason are counted as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count. See CRPL-F38, page 9.

Values missing because of D are counted as equal to or greater than the upper limit of the recorder.

Values missing because of G are counted:

1. For foF2, as equal to or less than foF1.
2. For h'F2, as equal to or greater than the median.

Values missing because of W are counted:

1. For foF2, as equal to or less than the median when it is apparent that h'F2 is unusually high; otherwise, values missing because of W are omitted from the median count.
2. For h'F2, as equal to or greater than the median.

Values missing for any other reason are omitted from the median count.

c. For MUF factor (M-factors):

Values missing because of G or W are counted as equal to or less than the median.

Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):

Values of fEs missing because of G (no Es reflections observed, the equipment functioning normally otherwise) are counted as equal to or less than the median foE, or equal to or less than the lower frequency count of the recorder.

Values of fEs missing for any other reason, and values of h'Es missing for any reason at all are omitted from the median count.

Beginning with data for November 1945, doubtful monthly median values for ionospheric observations at Washington, D. C., are indicated by parentheses, in accordance with the practice already in use for doubtful hourly values. The following are the conventions used to determine whether or not a median value is doubtful:

1. If only four values or less are available, the data are considered insufficient and no median value is computed.

2. For the F2 layer, if only five to nine values are available, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as there are at least five values, the median is not considered doubtful.

3. For all layers, if more than half of the values used to compute the median are doubtful (either doubtful or interpolated), the median is considered doubtful.

The same conventions are used by the CRPL in computing the medians from tabulations of daily and hourly data for stations other than Washington, beginning with the tables in IRPL-F18.

MONTHLY AVERAGE AND MEDIAN VALUES OF WORLD-WIDE IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 29 and figures 1 to 58 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Commonwealth of Australia, Ionospheric Prediction Service of the Commonwealth Observatory:
- Brisbane, Australia
- Canberra, Australia
- Hobart, Tasmania

National Laboratory of Radio-Electricity (French Ionospheric Bureau):
- Bagneux, France
- Portiers, France

Institute for Ionospheric Research, Lindau Uber Northeim, Hannover, Germany:
- Lindau/Harz, Germany

All India Radio (Government of India), New Delhi, India:
- Bombay, India
- Delhi, India
- Madras, India
- Tiruchirapalli, India

New Zealand Department of Scientific and Industrial Research:
- Christchurch, New Zealand (Canterbury University College Observatory)
- Rarotonga I.

Norwegian Defense Research Establishment, Kjeller per Lillestrom, Norway:
- Oslo, Norway

South African Council for Scientific and Industrial Research:
- Capetown, Union of South Africa
- Johannesburg, Union of South Africa

United States Army Signal Corps:
- Okinawa I.

National Bureau of Standards (Central Radio Propagation Laboratory):
Baton Rouge, Louisiana (Louisiana State University)
Boston, Massachusetts (Harvard University)
Guam I.
Huancayo, Peru (Instituto Geofisico de Huancayo)
Maui, Hawaii
San Francisco, California (Stanford University)
San Juan, Puerto Rico (University of Puerto Rico)
Trinidad, British West Indies
Washington, D. C.
White Sands, New Mexico

The tables and graphs of ionospheric data are correct for the values reported to the CRPL, but, because of variations in practice in the interpretation of records and scaling and manner of reporting of values, may at times give an erroneous conception of typical ionospheric characteristics at the station. Some of the errors are due to:

a. Differences in scaling records when spread echoes are present.

b. Omission of values when foF2 is less than or equal to foF1, leading to erroneously high values of monthly averages or median values.

c. Omission of values when critical frequencies are less than the lower frequency limit of the recorder, also leading to erroneously high values of monthly average or median values.

These effects were discussed on pages 6 and 7 of the previous F-series report IRPL-F5.

Ordinarily a blank space in the fEs column of a table is the result of the fact that a majority of the readings for the month are below the lower limit of the recorder or less than the corresponding values of foE. Blank spaces at the beginning and end of columns of h'F1, foF1, h'E, and foE are usually the result of diurnal variation in these characteristics. Complete absence of medians of h'F1 and foF1 is usually the result of seasonal effects.

The dashed-line prediction curves of the graphs of ionospheric data are obtained from the predicted zero-muf contour charts of the CRPL-D series publications. The following points are worthy of note:

a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.

b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.

c. There is no indication on the graphs of the relative reliability of the data; it is necessary to consult the tables for such information.

The following predicted smoothed 12-month running-average Zürich sunspot numbers were used in constructing the contour charts:

Month	Predicted Sunspot No.					
	1950	1949	1948	1947	1946	1945
December		108	114	126	85	38
November		112	115	124	83	36
October		114	116	119	81	23
September		115	117	121	79	22
August		111	123	122	77	20
July		108	125	116	73	
June		108	129	112	67	
May		108	130	109	67	
April		109	133	107	62	
March		111	133	105	51	
February		113	133	90	46	
January	105	112	130	88	42	

IONOSPHERIC DATA FOR EVERY DAY AND HOUR AT WASHINGTON, D. C.

The data given in tables 30 to 41 follow the scaling practices given in the report IRPL-C61, "Report of International Radio Propagation Conference," pages 36 to 39, and the median values are determined by the conventions given above under "Symbols and Terminology; Conventions for Determining Median Values." Beginning with September 1949, the data are taken at a new location, Ft. Belvoir, Virginia.

IONOSPHERE DISTURBANCES

Table 42 presents ionosphere character figures for Washington, D. C., during January 1950, as determined by the criteria presented in the report IRPL-R5, "Criteria for Ionospheric Storminess," together with Cheltenham, Maryland, geomagnetic K-figures, which are usually covariant with them.

Table 43 lists for the stations whose locations are given the sudden ionosphere disturbances observed on the continuous field intensity recordings made at Ft. Belvoir, Virginia, during January 1950.

Table 44 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Barbados, British West Indies, receiving station of Cable and Wireless, Ltd., for December 12, 1949.

Table 45 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Point Reyes, California, receiving station of RCA Communications, Inc., for January 20, 1950.

Table 46 lists for the stations whose locations are given the sudden ionosphere disturbances reported by the Institut für Ionosphärenforschung, as observed at Lindau, Harz, Germany, during November 1949.

Table 47 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, December 1949, compared with the CRPL daily radio disturbance warnings, which are primarily for the North Atlantic paths, the CRPL weekly radio propagation forecasts of probable disturbed periods, and the half-day Cheltenham, Maryland, geomagnetic K-figures.

The radio propagation quality figures are prepared from radio traffic and ionospheric data reported to the CRPL, in a manner basically the same as that described in IRPL-R31, "North Atlantic Radio Propagation Disturbances, October 1943 through October 1945," issued February 1, 1946. The scale conversions for each report are revised for use with the data beginning January 1948, and statistical weighting replaces what was, in effect, subjective weighting. Separate master distribution curves of the type described in IRPL-R31 were derived for the part of 1946 covered by each report; data received only since 1946 are compared with the master curve for the period of the available data. A report whose distribution is the same as the master is thereby converted linearly to the Q-figure scale. Each report is given a statistical weight which is the reciprocal of the departure from linearity. The half-daily radio propagation quality figure, beginning January 1948, is the weighted mean of the reports received for that period.

These radio propagation quality figures give a consensus of opinion of actual radio propagation conditions as reported by the half day over the two general areas. It should be borne in mind, however, that though the quality may be disturbed according to the CRPL scale, the cause of the disturbance is not necessarily known. There are many variables that must be considered. In addition to ionospheric storminess itself as the cause, conditions may be reported as disturbed because of seasonal characteristics such as are particularly evident in the pronounced day and night contrast over North Pacific paths during the winter months, or because of improper frequency usage for the path and time of day in question. Insofar as possible, frequency usage is included in rating the reports. Where the actual frequency is not shown in the report to the CRPL, it has been assumed that the report is made on the use of optimum working frequencies for the path and time of day in question. Since there is a possibility that all the disturbance shown by the quality figures is not due to ionospheric storminess alone, care should be taken in using the quality figures in research correlations with solar, auroral, geomagnetic, or other data. Nevertheless, these quality figures do reflect a consensus of opinion of actual radio propagation conditions as found on any one half day in either of the two general areas.

AMERICAN AND ZÜRICH PROVISIONAL RELATIVE SUNSPOT NUMBERS

Table 48 presents the daily American relative sunspot number, R_A, computed from observations communicated to CRPL by observers in America and abroad. Beginning with the observations for January 1948, a new method of reduction of observations is employed such that each observer is assigned a scale-determining "observatory coefficient," ultimately referred to Zürich observations in a standard period, December 1944 to September 1945, and a statistical weight, the reciprocal of the variance of the observatory coefficient. The daily numbers listed in the table are the weighted means of all observations received for each day. Details of the procedure are given in the Publication of the Astronomical Society of the Pacific, issued February 1949, in an article entitled "Reduction of Sunspot-Number Observations." The American relative sunspot number computed in this way is designated R_A. It is noted that a number of observatories abroad, including the Zürich observatory, are included in R_A. The scale of R_A was referred specifically to that of the Zürich relative sunspot numbers in the standard comparison period; since that time, R_A is influenced by the Zürich observations only in that Zürich proves to be a consistent observer and receives a high statistical weight. In addition, this table lists the daily provisional Zürich sunspot numbers, R_Z.

SOLAR CORONAL INTENSITIES OBSERVED AT CLIMAX, COLORADO

In tables 49a and 49b are listed the intensities of the green (5303A) line of the emission spectrum of the solar corona as observed during January 1950 by the High Altitude Observatory of Harvard University and the University of Colorado at Climax, Colorado, for east and west limbs, respectively, at 5-degree intervals of position angle north and south of the solar equator at the limb. Beginning January 11, 1949, the actual measurements are on solar rotation coordinates rather than astronomical coordinates; thus values of the correction P given in previous coronal tables are omitted. The time of observation is given to the nearest tenth of a day, GCT. The tables of coronal observations in CRPL-F29 to F41 listed the data on astronomical coordinates; the present format on solar rotation coordinates is in conformity with the tables of CRPL-1-4, "Observations of the Solar Corona at Climax, 1944-46."

Tables 50a and 50b give similarly the intensities of the first red (6374A) coronal line; tables 51a and 51b list the intensities of the second red (6704A) coronal line. The following symbols are used in tables 49, 50, and 51: a, observation of low weight; -, corona not visible; and X, position angle not included in plate estimates.

PLANETARY INDICES, PRELIMINARY MEAN K-INDICES, PRELIMINARY INTERNATIONAL CHARACTER FIGURES, MAGNETICALLY SELECTED DAYS

Table 52 gives geomagnetic planetary three-hour-range indices, Kp, for 1941 and 1942. It should be noted that Kp is without reduction because of the (rare) solar flare effects. Kp is designed to measure solar particle-radiation by its magnetic effects at eleven observatories between geomagnetic latitudes 47 and 63 degrees. Complete description of Kp has appeared in Bulletin 12b, "Geomagnetic Indices C and K, 1948" published in Washington, D. C., 1949, by the Association of Terrestrial Magnetism and Electricity, International Union of Geodesy and Geophysics. This bulletin has tables of Kp for 1945-48. Current tables of Kp appear in the Journal of Geophysical Research.

Table 53 gives preliminary mean K-indices, Kw, and international character figures, C, planetary indices, Kp, and also final magnetically selected days from magnetic observatories widely distributed over the Earth's surface. The selected days are preferentially derived using the four magnetic criteria: C-figures, sums of the eight daily mean K-indices, the greatest daily K-index, and the sums of the squares of the eight daily K-indices.

These tables have been furnished by the courtesy of the Committee on Characteristics of Magnetic Disturbance, ATME, IUGG. The majority of the world's magnetic observatories have cooperated in supplying the data. The Meteorological Office, De Bilt, Holland, has efficiently assembled and compiled the summary tables. The Chairman of the Committee has compiled Kp to supply the need of research workers in the ionospheric field for a specific index of solar particle-activity. Tables of Kp will ultimately be available from January 1, 1937, the beginning date for serious ionospheric records.

ERRATA

1. CRPL-F65, p. 13, table 14: The following changes should be made in the data in the (M3000)F2 column: At 00, (3.0); 01, (2.9); 03, (2.8); 08, (2.5); 22, (3.0).

2. (a) CRPL-F66, p. 7, par. 5, third line: Should read "receiving station of Cable and Wireless, Ltd.," instead of "receiving station of the RCA Communications, Inc."

   (b) CRPL-F66, p. 31, table 52: The heading should read "Reported by Engineer-in-Chief, Cable and Wireless, Ltd.," instead of "Reported by RCA Laboratories."

TABLES OF IONOSPHERIC DATA

Table 1

Washington, D. C. (38.7°N, 77.1°W) January 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	(4.0)						(2.8)
01	290	(4.1)						(2.8)
02	280	4.4						2.9
03	260	4.4						3.0
04	250	4.2						2.9
05	260	3.8						2.9
06	260	3.6						3.0
07	250	4.2						3.0
08	220	7.2			120	2.0		3.4
09	220	9.0			100	2.6		3.3
10	220	10.1	---	---	100	3.0		3.2
11	220	11.3	---	---	100	3.2		3.2
12	220	11.3	210	---	100	3.3		3.1
13	230	11.1	210	---	100	3.3		3.1
14	220	11.0	---	---	100	3.1		3.0
15	230	10.8			100	2.8		3.1
16	220	(10.6)			110	2.4		(3.1)
17	220	10.1			(130)	1.8		3.1
18	210	8.8						3.1
19	210	7.5						3.2
20	220	(5.8)						(3.1)
21	240	(5.0)						(3.0)
22	270	(4.6)						(2.9)
23	270	(4.0)						(2.8)

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 2

Oslo, Norway (60.0°N, 11.0°E) December 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	350	2.1						(2.6)
01	345	2.0						(2.6)
02	350	2.1						(2.6)
03	340	2.1						(2.6)
04	315	2.2						(2.7)
05	285	2.3						(2.8)
06	270	2.3						(2.8)
07	290	2.2						(3.0)
08	260	(3.0)						(2.8)
09	230	(5.9)			---	---	1.9	(3.1)
10	230	(8.4)			150	1.9	1.8	(3.2)
11	220	(10.4)			115	2.1		(3.2)
12	220	(11.6)			135	2.2		(3.2)
13	220	(12.4)			140	2.2		(3.2)
14	220	(12.0)			135	2.1		(3.2)
15	210	(10.2)			150	1.9		(3.1)
16	215	9.2						3.2
17	215	7.3						3.1
18	225	(5.5)						3.1
19	235	(3.8)						3.1
20	260	3.1						(3.0)
21	280	(2.6)						(2.8)
22	310	(2.2)						(2.7)
23	350	(2.0)						(2.7)

Time: 15.0°E.
Sweep: 1.6 Mc to 10.0 Mc in 5 minutes, automatic operation; supplemented by experimental recorder, 1.3 Mc to 14.0 Mc in 8 minutes.

Table 3

Boston, Massachusette (42.4°N, 71.2°W) December 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	5.0						2.7
01	275	5.1						2.7
02	265	4.8						2.8
03	260	4.8						2.8
04	255	4.4						2.9
05	260	4.0			---	---		2.8
06	260	4.1			---	---		2.8
07	250	5.9			---	---		3.0
08	230	9.4			---	---		3.1
09	230	10.8			---	---		3.2
10	235	12.6			---	---		3.1
11	230	12.6			---	---		3.1
12	240	12.6			---	---		3.0
13	240	12.6			---	---		3.0
14	240	12.6			130	3.0		3.0
15	235	12.6			125	2.9		3.0
16	230	12.2			135	2.6		3.0
17	230	9.8			---	---		3.0
18	230	9.5			---	---		3.0
19	230	7.0						2.9
20	245	6.6						2.9
21	250	6.0						2.8
22	260	5.5						2.8
23	275	5.4						2.7

Time: 75.0°W.
Sweep: 0.8 Mc to 14.0 Mc in 1 minute.

Table 4

San Francisco, California (37.4°N, 122.2°W) December 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.0					3.1	2.8
01	300	3.0					3.0	2.7
02	300	3.0					3.0	2.8
03	300	2.8					2.6	2.7
04	300	2.8					2.7	2.7
05	320	3.1					2.7	2.8
06	300	2.9					2.7	2.8
07	260	4.7			120	E	2.7	3.0
08	240	7.8			120	2.3	2.6	3.3
09	240	10.3	230	---	120	2.9		3.3
10	240	11.6	230	---	120	(3.3)		3.2
11	240	12.5	240	---	120	(3.5)		3.2
12	240	12.6	220	---	120	3.5		3.1
13	240	12.5	230	---	120	---		3.1
14	240	11.9	230	---	120	---		3.0
15	240	11.5	240	---	120	2.8	3.5	3.1
16	240	10.8	230	---	120	2.5	2.7	3.1
17	220	9.4	---	---	130	E	3.0	3.1
18	230	7.6	---	---	---	---	3.0	3.1
19	230	5.8					3.8	3.2
20	240	4.3					3.2	3.2
21	260	3.0					4.0	3.0
22	290	2.9					3.0	2.8
23	310	3.0					2.8	2.8

Time: 120.0°W.
Sweep: 1.3 Mc to 18.0 Mc in 4 minutes.

Table 5

White Sands, New Mexico (32.3°N, 106.5°W) December 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	3.8					3.3	2.8
01	260	3.7					3.0	3.0
02	260	3.4					2.9	2.9
03	280	3.2					3.0	2.7
04	280	3.0					2.4	2.6
05	300	2.9					2.6	2.6
06	280	3.1			---	---	2.7	2.8
07	240	6.0			120	(1.9)	2.9	3.0
08	230	9.0			120	(2.5)	3.8	3.2
09	240	10.4			110	3.0	4.0	3.2
10	230	11.3	---	---	110	3.3	4.2	3.0
11	230	11.8	220	---	110	3.5	4.8	2.9
12	230	12.1	220	---	110	3.6	4.8	2.9
13	230	12.1	220	---	110	3.5	5.0	2.8
14	240	12.0	---	---	110	3.4	4.6	2.8
15	230	11.6	---	---	110	(2.9)	4.8	2.9
16	230	11.0			110	(2.5)	4.4	3.0
17	220	9.8			(110)	---	3.8	3.0
18	(220)	7.8					3.6	3.0
19	220	6.1					3.9	3.0
20	(240)	4.7					3.7	3.0
21	260	3.8					3.6	3.0
22	280	3.7					3.6	2.7
23	280	3.8					3.2	2.8

Time: 105.0°W.
Sweep: 0.8 Mc to 14.0 Mc in 2 minutes.

Table 6

Baton Rouge, Louisiana (30.5°N, 91.2°W) December 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(290)	4.8						2.9
01	290	4.6						2.9
02	290	4.2						2.9
03	300	4.1						2.8
04	340	3.8						2.6
05	320	4.3						2.7
06	290	4.1						2.9
07	290	6.4						3.0
08	260	(9.0)	250	---	---	---		(3.2)
09	(280)	(10.1)	250	---	---	---		(3.0)
10	(280)	(11.2)	250	---	---	---		(3.0)
11	(290)	(11.8)	240	---	---	---		(2.9)
12	(290)	(12.0)	240	---	---	(3.6)		2.9
13	(300)	(12.3)	250	---	---	(3.6)		(2.8)
14	(300)	(12.0)	260	---	---	---		(2.9)
15	(290)	(12.0)	260	---	---	---		(2.9)
16	(270)	12.3	250	---	---	---		2.9
17	250	(10.5)	---	---				2.9
18	240	(8.3)						2.9
19	260	6.5						2.9
20	290	5.2						2.8
21	(300)	5.0						2.8
22	(310)	4.6						2.7
23	(320)	4.8						2.8

Time: 90.0°W.
Sweep: 2.12 Mc to 14.1 Mc in 5 minutes, eutometic operation.

Table 7

Okinawa I. (26.3°N, 127.7°E) December 1949*

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	240	5.5						3.1
01	240	4.5						2.9
02	230	4.5						3.4
03	250	3.5						(3.0)
04	260	3.0		---				3.0
05	320	2.8		---				2.9
06	290	3.2		---				3.0
07	280	5.8		5.0		---		3.0
08	250	11.0		---		---		3.1
09	240	13.0		---		---		3.1
10	250	(14.0)		---		---		(3.0)
11	260	14.0		---		---		3.1
12	260	(15.0)		---		---		(3.0)
13	260	15.0		---		---		3.0
14	280	15.5		---		---		3.0
15	270	16.5		---		---		3.0
16	250	16.0		---		---		2.9
17	240	15.0		---		---		3.0
18	220	14.5		---			3.6	3.0
19	200	12.0					3.5	3.0
20	210	12.0					2.8	3.1
21	220	7.2						3.0
22	230	6.2						3.0
23	240	6.0						3.1

Time: 135.0°E.
Sweep: 1.0 Mc to 24.0 Mc in 1 minute.
*Data for December 15 (1900 hour) through 31.

Table 8

Maui, Hawaii (20.8°N, 156.5°W) December 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	6.4					1.2	2.8
01	250	6.3						3.1
02	240	5.3						3.2
03	230	3.8						2.8
04	300	(3.1)						2.4
05	290	(2.9)						2.5
06	320	(3.0)						2.4
07	290	6.1	---	---	160	1.8		2.8
08	260	10.0	---	---	120	2.6	3.1	3.0
09	270	12.6	250	---	120	3.1	4.7	3.0
10	270	13.1	240	(4.6)	120	3.4	4.8	2.9
11	310	13.6	240	(5.5)	120	3.6	4.7	2.8
12	330	14.9	230	(6.4)	110	3.7	4.5	2.7
13	340	(15.2)	250	(6.2)	110	3.6	4.6	2.7
14	320	15.0	250	(6.0)	110	3.5	4.7	2.7
15	300	14.6	250	---	110	3.3	4.6	2.7
16	270	14.2	250	---	110	2.9	4.5	2.8
17	250	(12.9)			120	2.3	4.7	2.9
18	230	10.8					4.4	3.0
19	220	8.4					4.9	3.0
20	240	7.3					5.0	2.9
21	250	(7.1)					5.0	2.9
22	240	(6.4)					4.6	2.7
23	270	6.3					3.8	2.7

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 9

San Juan, Puerto Rico (18.4°N, 66.1°W) December 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	7.0						2.8
01	250	6.8						3.0
02	240	5.5						3.0
03	---	4.3						2.9
04	---	4.2						2.6
05	---	4.4						2.7
06	---	4.5						2.8
07	250	7.8		3.4				3.0
08	30	10.8		3.6		2.8		3.0
09	250	12.6		---		3.3		3.1
10	260	12.1		---		3.6		2.9
11	270	11.6		6.0		3.8		2.9
12	290	11.8		---		3.8		2.8
13	300	11.8		---		3.8	5.5	2.7
14	290	11.5		5.8		3.8		2.8
15	280	11.5		---		3.5	4.2	2.7
16	270	11.2		---		3.1	4.4	2.8
17	260	11.1		---		---	3.8	2.8
18	250	10.2					3.8	2.9
19	250	9.0						2.8
20	260	7.6						2.8
21	280	6.9						2.7
22	280	6.6						2.7
23	280	6.9						2.8

Time: 60.0°W.
Sweep: 2.8 Mc to 13.0 Mc in 9 minutes, automatic operation; supplemented by manual operation.

Table 10

Guam I. (13.6°N, 144.9°E) December 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	240	8.8					2.2	3.0
01	240	8.6						3.1
02	230	7.1						3.2
03	230	5.5						3.1
04	240	4.5						3.0
05	250	4.2					2.0	3.0
06	240	3.5					2.1	2.9
07	270	7.2			130	2.1	3.5	3.0
08	250	11.0	---	---	120	2.8	5.6	3.0
09	280	12.8	230	---	110	3.3	6.2	2.8
10	260	12.6	220	4.8	110	3.6	5.7	2.6
11	270	11.6	210	4.8	110	3.7	5.8	2.3
12	260	11.1	200	4.5	110	3.6	5.2	2.3
13	260	10.9	220	4.4	110	3.8	5.1	2.4
14	260	11.6	220	---	110	3.7	4.6	2.5
15	250	12.2	230	---	110	3.5	4.9	2.5
16	250	12.8	230	---	110	3.1	5.7	2.5
17	260	12.6	---	---	110	2.5	4.9	2.7
18	270	12.7			---	---	3.8	2.7
19	280	12.4					2.3	2.6
20	280	(11.8)					3.8	2.6
21	250	(11.2)					4.6	(2.9)
22	240	10.2					3.9	3.0
23	240	9.6					3.4	3.0

Time: 150.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 11

Trinidad, Brit. West Indies (10.6°N, 61.2°W) December 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	7.9						3.2
01	240	6.5						3.2
02	240	5.8						3.2
03	260	4.0						2.9
04	280	3.6						2.8
05	260	4.1						2.9
06	250	5.2			---	---	2.2	3.0
07	250	9.2			120	2.4	2.9	3.3
08	240	12.2	230	---	120	3.1	3.6	3.3
09	250	12.8	220	4.7	120	3.5	4.2	3.3
10	250	13.2	220	5.0	120	3.8	4.4	3.1
11	260	12.0	220	5.2	120	3.9	4.8	3.0
12	260	12.6	220	5.2	120	3.9	4.8	2.9
13	280	13.0	240	5.3	120	3.8	4.9	2.8
14	270	12.7	230	5.2	120	3.7	4.8	2.8
15	260	12.4	230	4.8	120	3.6	4.4	2.8
16	270	12.2	240	4.6	120	3.2	4.4	2.9
17	250	11.9	---	---	120	2.6	4.1	2.9
18	240	11.2			---	---	3.8	3.0
19	240	9.7					3.4	3.0
20	250	8.5					3.1	2.9
21	260	8.6					2.8	2.9
22	260	7.9					2.2	3.0
23	250	8.0						3.0

Time: 60.0°W.
Sweep: 1.5 Mc to 18.0 Mc, manual operation.

Table 12

Huancayo, Peru (12.0°S, 75.3°W) December 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	340	8.1					3.3	2.4
01	320	7.4					3.3	2.6
02	300	7.1					3.3	2.8
03	260	6.6					3.3	3.0
04	250	5.8					3.3	3.0
05	250	5.4				---	3.3	2.9
06	260	8.6				2.3	4.6	2.9
07	240	10.8				3.0	6.5	2.8
08	230	12.3	220	5.2		3.4	10.9	2.6
09	280	12.8	220	5.4		3.7	12.3	2.4
10	280	12.8	210	5.4		4.0	12.6	2.2
11	290	12.2	210	5.4		4.0	12.6	2.2
12	290	12.0	200	5.4		4.0	12.5	2.1
13	290	12.0	200	5.3		4.0	12.4	2.1
14	280	12.1	200	5.3		3.8	12.1	2.2
15	250	12.5	210	5.4		3.6	11.7	2.2
16	240	12.8				3.3	8.9	2.3
17	260	13.0				2.6	4.9	2.3
18	300	12.8				1.7	3.3	2.3
19	340	11.8						2.2
20	400	11.1						2.2
21	400	10.2					2.4	2.2
22	400	9.6					2.8	2.2
23	370	9.1					3.2	2.4

Time: 75.0°W.
Sweep: 16.0 Mc to 0.5 Mc in 15 minutes, automatic operation.

Table 13

Lindau/Harz, Germany (51.6°N, 10.1°E) November 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.8						
01	300	3.8						
02	310	3.4					2.0	
03	310	3.5						
04	290	3.2						
05	270	3.0						
06	260	2.8						
07	260	4.2			---	E		
08	220	7.1			120	1.7	2.4	
09	215	9.8			100	2.3	3.5	
10	210	11.6			100	2.6	3.7	
11	210	12.6			100	2.8	3.8	
12	210	12.7			100	3.0		
13	210	12.6			100	2.9	3.6	
14	215	12.6			100	2.8	3.6	
15	210	12.2			110	2.4	3.6	
16	210	11.3			130	1.8	3.6	
17	210	10.0					3.4	
18	210	8.2					2.8	
19	210	6.5					2.0	
20	220	5.0						
21	260	4.6						
22	290	4.0						
23	300	3.8						

Time: 15.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 8 minutes.

Table 14

Okinawa I. (26.3°N, 127.7°E) November 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	230	9.0						3.1
01	230	8.0						3.1
02	230	7.8						3.1
03	230	6.5						3.1
04	220	6.2						3.2
05	250	4.0		3.2				3.2
06	300	4.5		3.5				3.0
07	270	8.0		7.0		2.0		3.0
08	240	11.8		---		2.5		3.1
09	250	13.0		---		---		3.1
10	250	14.0		---		---		3.1
11	260	14.2		---		---		3.0
12	300	14.0		---		---		3.0
13	300	(14.5)		---		---		(3.0)
14	300	(15.0)		---		---		(3.0)
15	300	15.0		---		---		3.1
16	250	(14.0)		---		---		(3.1)
17	250	15.0		---		---	3.0	3.0
18	220	15.0					2.5	3.1
19	220	13.5					2.2	3.0
20	230	(13.0)						(3.1)
21	220	14.5						3.1
22	210	(13.0)						(3.1)
23	210	9.2						3.0

Time: 135.0°E.
Sweep: 1.0 Mc to 24.0 Mc in 1 minute.

Table 15

Johannesburg, Union of S. Africa (26.2°S, 28.0°E) November 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	7.6					1.9	2.7
01	260	7.0					1.9	2.8
02	260	6.6					1.6	2.8
03	260	6.0						2.8
04	280	5.4						2.8
05	280	5.7			---	---		2.8
06	240	7.9	---	---	110	2.5		3.0
07	240	9.3	230	---	110	(3.0)		2.9
08	260	10.3	220	---	110	(3.5)		2.8
09	300	11.0	220	5.2	110	3.8	4.0	2.7
10	340	11.4	210	5.8	110	3.9	4.3	2.6
11	350	11.8	210	5.9	110	---		2.6
12	360	12.0	210	5.8	110	---		2.6
13	360	12.2	210	5.9	110	---		2.6
14	360	11.9	220	5.7	110	4.0		2.6
15	350	11.9	220	5.6	110	(3.9)	4.0	2.6
16	330	11.6	230	6.0	110	(3.6)	3.8	2.6
17	(300)	11.3	240	---	110	(3.0)	3.2	2.7
18	260	11.3	---	---	110	2.2	2.1	2.8
19	250	11.0			---	---		2.8
20	250	10.2					1.9	2.8
21	250	9.3						2.8
22	260	8.5					1.8	2.8
23	270	8.0						2.7

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 16

Capetown, Union of S. Africa (34.2°S, 18.3°E) November 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	6.2					2.2	2.7
01	290	5.8					2.1	2.6
02	280	5.7					2.4	2.7
03	280	5.4					2.0	2.6
04	(300)	5.0					2.2	2.6
05	300	4.9					2.0	2.6
06	260	6.6			E	2.0	2.7	2.9
07	250	8.4	250	---	110	2.8	3.0	2.9
08	290	9.5	240	---	110	3.3	3.4	2.9
09	320	10.4	230	6.5	110	(3.6)	3.8	2.7
10	340	10.8	220	5.7	110	(3.8)	4.4	2.6
11	350	11.4	220	6.0	110	---		2.6
12	360	11.8	220	6.0	110	---		2.5
13	370	12.0	220	6.0	110	---		2.5
14	370	12.0	220	6.0	110	---		2.5
15	360	11.9	230	5.8	110	(3.9)		2.6
16	340	11.6	230	5.6	110	(3.6)		2.6
17	320	11.2	240	---	110	3.3		2.6
18	280	11.0	250	---	110	2.8	3.2	2.7
19	260	10.7	---	---	110	2.0	2.4	2.8
20	250	9.8					2.6	2.8
21	240	8.5					2.4	2.8
22	250	7.3					2.1	2.8
23	270	8.6					2.1	2.7

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 17

Christchurch, New Zealand (43.5°S, 172.7°E) October 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	7.2					2.3	2.5
01	300	6.5					2.0	2.5
02	320	6.0					2.8	2.5
03	290	5.8					2.3	2.5
04	300	5.4					2.3	2.5
05	300	5.3	---	---		1.4	2.4	2.7
06	270	6.1	---	---		2.0	3.0	2.9
07	280	7.4	250	4.1		2.8	3.6	2.9
08	290	8.3	240	4.6		3.2	3.5	2.8
09	320	9.0	240	5.1		3.4	3.8	2.8
10	330	9.5	240	5.4		3.5		2.8
11	300	9.8	230	5.4		3.6		2.7
12	320	10.2	230	5.5		3.7		2.7
13	280	10.1	240	5.2		3.6		2.7
14	280	10.0	240	5.2		3.5	3.5	2.7
15	340	9.6	250	5.5		3.4	3.6	2.7
16	250	9.5	260	4.8		3.0	3.3	2.7
17	260	9.6	---	---		2.5	2.8	2.7
18	270	9.6				1.6	2.7	2.7
19	270	9.4				---	2.2	2.7
20	280	8.7					2.3	2.6
21	280	8.2					2.4	2.6
22	290	7.7					2.2	2.5
23	290	7.5					2.4	2.5

Time: 172.5°E.
Sweep: 1.0 Mc to 13.0 Mc.

Table 18

Delhi, India (28.6°N, 77.1°E) September 1949

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2**
00	440	8.0						2.5
01	440	7.5						
02	---	(6.9)						
03								
04	---	(6.2)						2.5
05	440	6.3						
06	400	7.6						
07	380	9.4						
08	380	11.2						2.7
09	420	11.0						
10	470	(11.7)						
11	450	12.6						
12	490	13.4						2.4
13	(480)	(13.9)						
14	(480)	(14.0)						
15	---	(13.7)						
16	---	(13.2)						
17	---	(12.5)						
18	---	(12.3)						
19	(440)	(11.8)						
20	(460)	(11.2)						2.4
21	440	(10.2)						
22	440	9.0						2.4
23	440	8.2						

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 6 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 19

Bombay, India (19.0°N, 73.0°E) September 1949

Time	* foF2	h'F1	foF1	h'E	foE	fEs	** (M3000)F2
00							
01							
02							
03							
04							
05							
06							
07	360 7.9						
08							
09	480 9.7						
10	540 10.7						
11	(540) (11.5)						
12	--- (12.0)						2.6
13	--- ---						
14	--- (13.0)						
15	--- (12.8)						
16	--- (12.7)						2.3
17	--- (12.9)						
18	--- (12.4)						
19	510 11.4						
20	480 10.8						2.5
21	(480) (10.5)						
22	(480) (9.8)						2.7
23							

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 20

Madras, India (13.0°N, 80.2°E) September 1949

Time	* foF2	h'F1	foF1	h'E	foE	fEs	** (M3000)F2
00							
01							
02							
03							
04							
05							
06							
07	420 10.0						
08	420 11.0						2.6
09	480 11.5						
10	480 11.3						
11	480 11.8						
12	510 11.9						2.4
13	510 12.1						
14	540 12.4						
15	540 12.5						
16	540 12.8						2.3
17	510 (13.2)						
18	510 (12.8)						
19	(510) (11.5)						
20	--- (11.0)						2.5
21	--- 11.0						
22	--- (11.0)						
23							

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 21

Tiruchirapalli, India (10.8°N, 78.8°E) September 1949

Time	* foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00							
01							
02							
03							
04							
05							
06							
07	360 9.5						
08	420 11.5						
09	540 11.9						
10	560 11.7						
11	560 11.5						
12	600 11.6						
13	600 11.6						
14	600 11.8						
15	(600) 11.8						
16	570 12.0						
17	600 12.0						
18	600 11.9						
19	610 11.7						
20	660 11.6						
21	640 12.0						
22	--- ---						
23							

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.

Table 22

Rarotonga I. (21.3°S, 159.8°W) September 1949

Time	h'F2 foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260 10.7						2.8
01	260 10.0						2.9
02	250 8.6						2.9
03	270 7.5						2.8
04	280 6.8						2.8
05	290 5.9						2.7
06	300 8.0						2.7
07	250 11.0	---	---	120	2.6	3.6	3.1
08	240 12.8	230	4.3	110	3.2	4.1	3.0
09	250 13.5	230	6.0	110	3.5	4.2	3.0
10	270 14.0	230	6.0	110	3.7	4.5	3.0
11	260 13.3	230	6.2	110	3.9	4.5	2.9
12	270 13.0	220	5.5	110	3.9	4.5	2.8
13	290 13.0	210	6.7	110	3.9	4.8	2.8
14	330 12.3	220	6.3	110	3.7	4.8	2.7
15	320 12.2	240	6.2	110	3.6	4.6	2.7
16	320 12.8	240	6.0	110	3.2	4.3	2.6
17	260 12.6	230	---	110	2.6	3.8	2.7
18	280 12.5			---	---	3.4	2.8
19	280 12.6					3.4	2.8
20	270 12.4					3.3	2.8
21	250 11.9					2.8	2.8
22	260 12.0					2.5	2.8
23	260 11.0						2.8

Time: 157.5°W.
Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Table 23

Brisbane, Australia (27.5°S, 153.0°E) September 1949

Time	h'F2 foF2	h'F1	foF1	h'E	foE	fEe	(M3000)F2
00	250 7.5					2.0	2.8
01	250 7.1					2.1	2.8
02	240 6.6					2.0	2.8
03	240 5.7					2.6	2.7
04	290 5.5					2.6	2.7
05	280 5.6			---	E		2.7
06	250 7.5			150	2.1		3.0
07	250 10.0	---	---	110	2.8		3.2
08	240 11.5	240	4.6	110	3.3		3.2
09	250 11.8	230	5.0	110	3.7		3.1
10	260 11.8	220	5.1	110	3.8		3.0
11	270 11.2	220	5.3	100	3.9		2.9
12	270 11.2	210	5.2	100	3.9		2.8
13	250 11.0	210	5.0	110	3.8		2.8
14	250 10.3	210	4.9	110	3.7		2.8
15	250 10.2	220	4.4	100	3.5		2.8
16	240 10.0	240	4.2	100	3.0		2.8
17	250 9.6			110	2.4	2.6	2.9
18	250 9.0			---	(<1.5)	2.6	2.9
19	250 8.9					1.9	2.8
20	260 8.6					2.0	2.8
21	270 8.6						2.9
22	250 8.3						2.9
23	260 8.1					2.0	2.8

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 24

Canberra, Australia (35.3°S, 149.0°E) September 1949

Time	h'F2 foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250 6.8					2.0	2.8
01	250 6.6					2.2	2.8
02	250 6.4					2.4	2.7
03	240 5.9					2.3	2.8
04	240 5.5					2.4	2.7
05	270 5.3					2.0	2.7
06	250 5.8			150	1.6	2.4	2.9
07	240 8.4	---	---	100	2.6	2.8	3.2
08	240 10.0	230	4.3	100	3.0	3.1	3.1
09	250 10.9	220	4.5	100	3.4		3.1
10	250 11.2	210	4.8	100	3.5		3.0
11	260 11.5	210	5.0	100	3.7		3.0
12	270 11.5	210	5.0	100	3.9		2.9
13	260 11.1	210	5.0	100	3.8		2.8
14	260 10.7	210	5.0	100	3.7		2.8
15	250 10.5	210	4.5	100	3.5	2.8	2.9
16	240 10.2	220	4.0	100	3.1	2.8	2.9
17	240 9.8	---	---	100	2.5	2.9	2.9
18	240 9.2			(200)	1.7	2.4	2.9
19	240 8.5					2.5	2.8
20	250 8.5						2.8
21	250 8.1					2.3	2.8
22	250 7.6					2.4	2.8
23	250 7.4						2.8

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 25

Hobart, Tasmania (42.8°S, 147.4°E) September 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	6.0					2.1	
01	260	5.6					2.5	
02	260	5.4					2.6	
03	250	5.0					2.5	
04	250	4.4					3.0	
05	260	4.0					2.4	
06	250	4.6			---	E	2.4	
07	240	6.8			(100)	2.3	3.5	
08	230	8.5	---	---	(100)	2.8	3.6	
09	250	8.9	230	4.4	---	3.2	3.6	
10	250	9.8	220	4.6	---	3.5	3.0	
11	250	(10.0)	210	4.8	---	3.6	3.8	
12	260	(10.6)	220	5.0	100	3.7	2.9	
13	260	(10.6)	210	4.8	---	3.7	3.1	
14	250	10.6	210	4.6	---	3.5	3.4	
15	250	10.3	220	4.4	---	3.3	3.0	
16	230	(10.1)	220	---	---	2.9	2.8	
17	240	10.1			100	2.4	2.5	
18	230	9.3			---	E	2.1	
19	220	8.5					2.1	
20	230	8.0					2.0	
21	240	7.5					2.0	
22	250	6.9					2.1	
23	250	6.7					2.5	

Time: 150.0°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 26

Bagneux, France (48.8°N, 2.3°E) July 1949*

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	---	---						---
01	---	---						---
02	---	---						---
03	---	---						---
04	---	---						---
05	---	---			---	---		(2.8)
06	(290)	(7.7)	240	---	100	3.0	(3.8)	(2.8)
07	(300)	(7.8)	240	---	100	3.2	(4.0)	2.8
08	320	8.1	210	5.0	100	3.4	5.3	(2.8)
09	(350)	(8.0)	230	5.4	100	3.6	(5.9)	(2.9)
10	(330)	(7.7)	230	(5.4)	100	---	(4.3)	(2.9)
11	350	8.0	220	5.4	100	3.6	5.2	2.9
12	360	(7.8)	220	5.4	100	---	4.3	2.8
13	360	7.9	210	5.4	100	3.7	4.0	2.8
14	(350)	(7.8)	210	5.5	100	3.6	5.0	2.8
15	350	(7.7)	230	5.4	100	3.6	4.8	(2.8)
16	320	(7.8)	225	---	100	3.4	(3.9)	(2.9)
17	300	(7.6)	220	---	100	3.0	4.4	(2.9)
18	(280)	(8.0)	240	---	100	2.8	3.5	(3.0)
19	(290)	(8.1)	---	---	---	E	(4.7)	(3.0)
20	(290)	(8.0)	260	---	---	E	(5.1)	(2.9)
21	(300)	(7.8)					(5.4)	(2.9)
22	(280)	(8.1)					(3.3)	(2.7)
23	---	---						---

Time: 0.0°.
Sweep: July 1 through 6 -- 2.2 Mc to 16.0 Mc in 1 minute 5 seconds;
July 19 through 30 -- 16 Mc to 16.0 Mc in 1 minute 30 seconds.
*Data for 1 through 6 and 19 through 30, only.

Table 27

Poitiers, France (46.6°N, 0.3°E) July 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	(7.3)						(2.7)
01	300	(7.1)						(2.8)
02	300	(6.8)						(2.8)
03	300	(6.5)						(2.8)
04	310	(6.2)			---			2.7
06	(320)	(6.6)	---	---	---			2.8
06	300	(7.6)	230	---	---		3.7	3.0
07	300	7.8	225	4.6	100		4.0	3.0
08	330	7.9	220	4.7	115		4.2	2.9
09	320	8.0	220	4.7	105		4.7	2.9
10	330	8.0	210	5.1	105		4.6	2.8
11	330	8.0	220	5.1	100		4.9	2.9
12	350	7.8	210	5.1	105		5.0	2.8
13	350	7.8	220	5.0	105		4.9	2.8
14	350	7.7	216	5.0	100		4.4	2.8
15	330	7.7	215	5.1	100		4.8	2.8
16	330	7.6	220	---	115		4.2	2.9
17	310	7.8	230	---	---		3.8	3.0
18	300	8.0	230	---	---		4.0	2.9
19	280	(8.4)	250	---	---		3.5	3.0
20	260	8.2					3.9	3.0
21	280	8.1					3.3	2.8
22	280	(7.8)						2.8
23	300	(7.6)						(2.8)

Time: 0.0°.
Sweep: 3.1 Mc to 11.8 Mc in 1 minute 15 seconds.

Table 28

Bagneux, France (48.8°N, 2.3°E) June 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	---	---						---
01	---	---						---
02	---	---						---
03	---	---	---	---				---
04	---	---	---	---	---	---		---
05	---	---	---	---	---	---		---
06	300	7.7	240	4.4	105	2.9	4.1	3.0
07	355	7.8	240	4.9	100	3.1	4.2	2.7
08	325	7.6	230	4.9	100	3.4	4.5	2.8
09	350	8.0	230	5.1	100	3.5	5.3	2.8
10	360	8.0	218	5.4	100	3.7	4.6	2.8
11	390	8.2	210	6.4	100	3.7	5.4	2.8
12	375	8.0	210	5.3	100	3.6	4.4	2.9
13	355	7.8	222	5.4	100	3.7	4.4	2.9
14	360	8.0	226	5.4	100	3.6	4.5	2.8
16	350	7.8	228	6.2	105	3.5	4.0	2.8
16	350	7.7	248	5.0	105	3.4	4.4	(2.8)
17	332	7.8	246	---	110	3.0	4.7	2.9
18	300	8.0	250	---	108	2.7	4.6	2.9
19	275	8.4	250	---	---	E	3.6	3.0
20	255	8.5	---	---			3.6	3.0
21	260	8.4					2.9	2.8
22	280	8.2					2.7	2.7
23	---	---						---

Time: 0.0°.
Sweep: 2.2 Mc to 16.0 Mc in 1 minute 5 seconds.

Table 29

Poitiers, France (46.6°N, 0.3°E) June 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	7.6						2.7
01	315	7.5						2.6
02	300	7.2						2.6
03	280	(6.8)						2.6
04	290	6.7			---			2.8
05	330	7.0	---	---	---			2.8
06	290	7.5	230	4.1	---		3.6	2.9
07	310	7.6	230	4.4	---		4.0	2.9
08	330	7.6	220	5.0	120		4.8	2.8
09	330	8.0	220	4.9	110		4.4	2.8
10	350	8.0	220	5.4	105		5.1	2.8
11	350	8.0	220	5.5	100		5.2	2.8
12	370	8.0	205	5.4	100		5.0	2.8
13	350	8.0	215	5.4	100		4.9	2.8
14	360	7.5	220	5.6	105		5.2	2.8
15	350	7.6	225	---	120		4.7	2.8
16	350	7.5	230	5.0	120		5.0	2.8
17	320	7.8	230	---	---		4.9	2.9
18	300	8.0	250	---	---		5.2	2.9
19	280	8.5	270	---	---		5.0	2.9
20	270	8.4	---	---			4.0	2.9
21	275	8.3						2.8
22	290	8.1						2.7
23	300	7.6						2.7

Time: 0.0°.
Sweep: 3.1 Mc to 11.8 Mc in 1 minute 15 seconds.

TABLE 30

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

h'F2 (Characteristic), Km (Unit), January (Month), 1950

Observed at Washington, D.C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B.E.B., J.D., C.B.P.

Calculated by: B.E.B., C.B.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	280	280	270	240	230	250	230	210	210	210	220	210	230	220	210	230	220	210	210	210	230	270	270	300
2	290	270	230	240	250	270	260	220	210	220	210	220	220	210	220	230	210	220	210	200	230	240	270	270
3	270	260	260	250	240	280	240	210	210	⊕210	220	210	220	230	250	230	220	220	220	220	210	210	230	230
4	260	270	280	260	270	300	250	210	210	230	220	220	210	200	220	230	220	210	210	210	210	(220)^{A}	230	(270)^{S}
5	(270)^{S}	(280)^{S}	270	260	(250)^{A}	250	250	250	210	220	210	210	250	230	220	230	210	210	210	210	230	260	270	[280]^{C}
6	280	290	270	250	250	260	250	250	210	220	230	250	230	250	220	220	200	210	210	210	250	270	280	250
7	270	260	260	230	220	270	270	210	210	210	220	220	220	230	250	230	220	220	220	210	230	270	280	290
8	300	270	250	250	270	250	240	220	210	210	250	230	230	220	210	220	220	210	220	220	290	280	300	300
9	310	300	280	230	230	(240)^{S}	300	250	230	210	210	250	220	210	210	230	220	220	220	210	210	250	[250]^{C}	250
10	270	(270)^{S}	270	230	(230)^{S}	260	250	230	210	220	200	230	200	210	260	230	220	220	200	220	220	240	240	250
11	270	270	C	C	C	C	C	C	C	200	210	230	240	230	220	220	220	220	220	210	210	230	240	250
12	290	300	280	[260]^{C}	230	230	230	230	210	210	210	220	210	250	210	230	230	210	220	210	220	250	270	260
13	260	270	270	240	250	230	260	280	230	230	210	230	200	250	220	230	230	210	210	210	220	230	250	290
14	290	300	290	270	250	230	290	250	210	220	210	260	210	240	210	230	220	210	220	220	200	250	270	270
15	270	290	280	260	250	270	270	260	220	220	220	210	200	230	210	230	220	210	200	210	200	240	260	260
16	300	300	280	300	300	270	280	230	210	220	200	220	220	[230]^{C}	240	240	240	220	240	210	220	250	280	290
17	290	(310)^{S}	280	270	260	230	250	250	220	220	220	230	220	270	220	200^{H}	230	210	220	220	210	250	280	(300)^{S}
18	300	300	290	270	230	240	270	250	230	230	260	230	250	270	230	220	210	210	200	210	220	230	300	300
19	300	300	300	250	270	240	250	270	220	220	210	210	210	230	260	210^{H}	230	220	200	210	220	260	280	290
20	300	270	250	230	270	270	(280)^{S}	270	220	T	T	260	240	230	220	220	220	220	210	210	220	230	280	290
21	260	310	280	270	270	270	270	260	230	220	210	200	270	220	230	230	220	220	210	210	210	240	290	270
22	310	310	290	260	230	230	260	250	220	220	230	220^{H}	210	220	210	230	220	210	230	220	220	240	270	300
23	(300)^{S}	(300)^{S}	300	250	240	(300)^{S}	(280)^{S}	240	210	210	210	230	200	220	230	220	230	210	230	230	240	220	280	260
24	280	260	250	270	270	300	290	240	230	220	230	220	220	250	240	230	240^{K}	220^{K}	230^{K}	250^{K}	250^{K}	250^{K}	270^{K}	280^{K}
25	320^{K}	330^{K}	330^{K}	300^{K}	320^{K}	280^{K}	270^{K}	270	220	220	220	C	C	220	220	220	220	230	210	220	220	250	240	270
26	300	300	280	250	240	240	270	250	230	220	220	210	220	230	210	200^{H}	220	210	230	240	230	230	280	290
27	290	270	280	240	250	230	270	250	230	230	220	210^{H}	230	220	200	210^{H}	230	230	210	220	220	220	250	(250)^{S}
28	300	260	280	270	260	250	230	250	220	230	210	220	210^{H}	210	230	220^{H}	[220]^{C}	230	230	230	220	[230]^{C}	240	270
29	270	[280]^{C}	(290)^{S}	240	270	260	250	230	210	220	220	220	220	220	210	240	230	220	200	220	230	260	260	280
30	280	290	280	280	300	300	290	240	230	210	200^{H}	220	210	240	220	220	230	220	220	220	220	230	270	280
31	(270)^{S}	290	280	270	290	270	260	250	230	220	260	210	200^{H}	200^{H}	230	200	[210]^{H}	220	210	230	230	220	260	270
Median	290	290	280	260	250	260	260	250	220	220	220	220	220	230	220	230	220	220	210	210	220	240	270	270
Count	31	31	30	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

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TABLE 31

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Form adopted June 1946

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), January (Month), 1950

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Scaled by: B.E.B, J.D, C.B.P.

Lat 38.7°N, Long 77.1°W — 75°W Mean Time

Calculated by: B.E.B, C.B.P

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(5.9)$^{S}_{S}$	(6.4)$^{S}_{S}$	(6.2)$^{S}_{S}$	(6.3)$^{S}_{S}$	4.9^{F}	4.5^{F}	4.4^{F}	(4.3)$^{S}_{F}$	(7.9)$^{S}_{F}$	(10.3)^{S}	11.6	12.6	(12.1)^{S}	11.4	11.2	(11.9)^{S}	(11.4)^{S}	(11.8)$^{S}_{P}$	(10.2)^{S}	(8.7)^{S}	(5.1)$^{S}_{F}$	(5.1)$^{S}_{F}$	(5.1)$^{S}_{F}$	(5.4)^{F}
2	(5.7)$^{S}_{P}$	(6.3)$^{S}_{S}$	(5.7)$^{S}_{S}$	(6.0)$^{S}_{P}$	5.2	5.0	(5.2)$^{S}_{P}$	5.1	7.7	10.8	12.6	12.5	12.2	(12.1)^{S}	(12.3)^{S}	(12.3)$^{S}_{P}$	(11.4)^{S}	10.7	9.2	7.5	(5.8)$^{S}_{S}$	(5.4)$^{S}_{P}$	5.1	5.1
3	4.9	4.9	4.9	4.8	4.5	4.3	(4.4)^{S}	4.0	7.3	9.2	(11.6)^{S}	12.1	(12.5)^{S}	11.5	(11.7)^{S}	(11.4)$^{S}_{P}$	(10.6)$^{S}_{S}$	(10.6)^{S}	(9.3)$^{S}_{P}$	(7.7)$^{S}_{P}$	(7.4)$^{S}_{P}$	(5.8)$^{S}_{F}$	(5.2)$^{S}_{F}$	(7.4)^{S}
4	(4.0)$^{S}_{S}$	(3.9)$^{S}_{P}$	(4.0)$^{S}_{P}$	(3.4)$^{S}_{P}$	3.3^{F}	3.5^{F}	(4.2)$^{S}_{F}$	(4.2)$^{S}_{P}$	(7.1)^{S}	10.7	12.0	12.2	12.2	(12.0)$^{S}_{S}$	12.3	(12.3)$^{S}_{S}$	(11.4)$^{S}_{S}$	11.1	10.1	(8.2)^{S}	(7.4)$^{S}_{S}$	(6.0)^{S}	5.2	5.4^{F}
5	(3.3)^{F}	(3.7)^{F}	(3.9)$^{S}_{P}$	4.2^{F}	(4.4)^{F}	3.7^{F}	3.5^{F}	3.8^{F}	7.2^{F}	10.0	11.1	11.7	11.7	11.0	(11.3)^{S}	(12.0)$^{S}_{S}$	(10.5)$^{S}_{S}$	(9.3)$^{S}_{P}$	9.0	(7.3)^{S}	5.6	(5.1)$^{S}_{P}$	(7.0)$^{S}_{P}$	(8.1)$^{S}_{P}$
6	(4.0)$^{S}_{S}$	[4.0]$^{S}_{F}$	(4.7)$^{S}_{F}$	(5.1)$^{S}_{P}$	4.5^{F}	(4.5)$^{S}_{P}$	(4.3)^{S}	4.1^{F}	(6.7)$^{S}_{S}$	9.3	11.8	12.3	11.8	11.7	11.8	(11.8)$^{S}_{S}$	(10.6)$^{S}_{S}$	(10.0)$^{S}_{S}$	8.4	6.6	5.0	5.1	(7.0)$^{S}_{S}$	5.2
7	5.1	5.3	5.3	5.5	4.7	(4.0)$^{S}_{S}$	(3.9)$^{S}_{S}$	(4.1)$^{S}_{S}$	7.3	9.3	10.4	11.9	11.1	(10.7)^{P}	(11.3)^{P}	11.0	10.1	(10.4)$^{S}_{S}$	8.5	(6.6)$^{S}_{S}$	4.2^{F}	(3.5)$^{S}_{S}$	3.3	(3.4)$^{S}_{P}$
8	(3.7)$^{S}_{S}$	(4.0)$^{S}_{S}$	(3.9)^{S}	(4.0)$^{S}_{S}$	(3.7)$^{S}_{S}$	3.8^{F}	(3.7)$^{S}_{P}$	3.8	6.6	7.6	(11.5)$^{S}_{P}$	11.6	10.1	9.8	9.3	9.3	(7.4)$^{S}_{S}$	8.6	(7.0)$^{S}_{P}$	7.0	4.8	(4.0)^{S}	(3.9)$^{S}_{S}$	(4.2)$^{S}_{S}$
9	4.7	(4.9)^{P}	5.4	5.6	4.8	3.4	3.6	(4.2)$^{S}_{P}$	8.0	9.1	(10.3)$^{S}_{P}$	11.8	11.5	10.6	10.1	10.3	10.0	9.6	8.6	7.4	(5.7)$^{S}_{S}$	(4.8)$^{S}_{S}$	[4.8]^{C}	4.5
10	(4.2)$^{S}_{F}$	(4.2)$^{S}_{S}$	4.7	4.7	3.8^{F}	3.8^{F}	3.7^{F}	4.0	(7.2)$^{S}_{S}$	(8.2)$^{S}_{S}$	10.4	11.2	10.6	10.5	10.8	10.7	10.2	9.2	8.5	7.3	6.0	5.0	4.6	4.6
11	4.7	4.5	C	C	C	C	C	C	C	(7.5)^{F}	(9.9)$^{S}_{S}$	11.2	11.3	11.3	11.4	11.3	(10.5)^{S}	(10.2)^{S}	(9.5)$^{S}_{P}$	7.7	6.4	4.3	(4.5)^{S}	(3.9)$^{S}_{S}$
12	(3.8)$^{S}_{F}$	(3.9)$^{S}_{F}$	3.9^{F}	[4.2]^{C}	4.4^{F}	3.6^{F}	3.1^{F}	3.2^{F}	(6.1)^{S}	7.7	9.5	10.4	10.7	10.2	(10.1)$^{S}_{H}$	(10.7)^{S}	(10.9)^{S}	10.1	9.2	(7.5)^{S}	(5.0)^{S}	(4.5)$^{S}_{S}$	(4.4)^{S}	4.7
13	4.8	4.6	4.5	4.4	(4.3)^{S}	3.3^{F}	2.7^{Z}	(3.3)^{S}	6.0^{F}	7.8	8.6	9.7	9.7	10.0	10.2	10.4	(9.7)$^{S}_{P}$	9.4	(8.1)$^{S}_{P}$	(6.7)$^{S}_{P}$	5.2	4.4	(3.9)$^{S}_{S}$	(3.7)^{S}
14	(3.9)$^{S}_{F}$	3.6^{F}	(4.0)$^{S}_{F}$	(4.4)$^{S}_{F}$	4.5	3.9^{F}	3.9^{F}	(4.6)^{S}	6.6	8.3	9.5	11.5	10.7	11.3	(9.8)$^{S}_{P}$	10.0	10.4	9.3	8.1	(7.1)$^{S}_{P}$	5.4	(3.9)^{S}	(3.6)$^{S}_{S}$	3.3
15	3.3	3.3	3.5^{F}	3.6^{F}	3.6	3.3	3.2^{F}	3.9^{F}	6.4	8.7	9.2	9.6	10.1	4.7	9.9	10.3	9.8	9.5	8.1	7.5^{F}	(6.0)$^{S}_{F}$	3.5^{F}	3.5^{F}	(3.3)^{F}
16	(3.5)^{S}	(3.2)^{F}	3.2^{F}	(2.6)$^{S}_{F}$	2.5^{V}	2.9^{F}	3.2^{F}	3.8^{F}	6.9^{F}	7.8	8.7	(10.2)^{S}	10.7	[10.2]^{C}	9.6	9.5	(9.7)$^{S}_{S}$	8.4	(6.9)$^{S}_{S}$	(6.7)$^{S}_{P}$	(4.5)$^{S}_{F}$	(3.3)^{F}	(3.2)$^{S}_{F}$	(2.8)$^{S}_{F}$
17	(2.5)$^{S}_{F}$	(2.5)$^{S}_{F}$	(3.2)^{F}	3.3^{F}	4.1^{F}	(3.8)$^{S}_{H}$	3.4^{F}	3.7	6.5	7.8	8.7	9.8	(9.4)^{S}	10.1	(8.9)$^{S}_{S}$	(9.6)$^{S}_{P}$	(9.4)$^{S}_{P}$	8.0	(6.7)$^{S}_{P}$	6.6	4.7	3.0	2.9	(2.7)$^{S}_{P}$
18	2.9^{F}	(3.3)$^{S}_{F}$	(3.8)$^{S}_{F}$	4.3^{F}	(4.2)$^{S}_{S}$	3.8	3.4	(4.2)^{S}	7.3	8.5	9.3	10.0	10.0	9.2	9.4	9.6	(9.1)^{S}	8.6	6.7	6.7	(5.3)$^{S}_{P}$	3.4	2.9	(2.8)^{S}
19	(3.1)$^{S}_{P}$	(3.5)^{S}	(3.9)^{S}	(4.0)$^{S}_{S}$	(3.6)$^{S}_{F}$	3.4^{F}	3.1^{F}	3.7^{F}	6.9	8.0	(8.6)$^{S}_{S}$	10.6	11.3	11.1	10.8	(10.8)$^{S}_{P}$	11.3	(10.6)$^{S}_{S}$	(9.2)$^{S}_{P}$	(6.7)^{S}	5.5	(4.7)$^{S}_{F}$	(3.9)$^{S}_{F}$	(4.1)$^{S}_{S}$
20	(4.9)$^{S}_{F}$	(5.2)$^{S}_{F}$	(5.3)$^{S}_{F}$	5.3	(4.4)$^{S}_{F}$	4.7	(3.0)$^{S}_{H}$	4.2	(6.9)^{S}	[9.0]^{T}	[9.8]^{T}	11.5	(11.7)$^{S}_{S}$	11.7	(11.9)$^{S}_{S}$	11.0	11.3	(9.6)^{S}	7.5	6.8^{F}	(5.2)$^{S}_{F}$	(4.0)$^{S}_{S}$	(3.6)$^{S}_{F}$	(3.7)$^{S}_{F}$
21	(3.6)$^{S}_{F}$	3.4^{F}	3.6^{F}	3.4^{F}	3.4^{F}	3.0^{F}	3.1^{F}	(3.9)$^{S}_{S}$	6.9^{F}	8.6	9.6	9.6	11.3	11.2	11.3	10.8	(10.7)^{S}	10.6	8.7	(7.5)^{S}	(5.5)$^{S}_{P}$	(3.9)$^{S}_{F}$	(3.8)$^{S}_{F}$	(3.6)$^{S}_{F}$
22	3.2^{F}	(3.8)$^{S}_{S}$	4.4	4.6^{F}	4.3^{F}	3.6^{F}	3.5^{F}	4.2	7.3	9.2	9.9	11.3	10.9	10.5	9.9	9.9	9.6	8.5	8.0	7.4	5.6	(4.1)^{S}	(3.9)^{S}	3.6
23	(3.3)^{S}	3.3	(3.6)$^{S}_{S}$	(3.8)$^{S}_{S}$	3.5	2.8	2.8	(3.9)^{S}	6.8	8.0	8.4^{V}	10.3	(10.6)^{S}	11.1	11.0	10.7	10.9	9.7	8.0	7.8	(6.1)^{S}	5.3	(5.1)^{S}	5.0
24	4.9	(5.0)^{S}	4.5^{F}	(4.1)$^{S}_{S}$	4.0	3.6	3.8^{F}	4.7^{F}	8.0	8.6^{F}	9.8	11.4	(11.4)^{P}	10.6	(11.8)$^{S}_{S}$	(12.0)$^{S}_{S}$	(12.0)$^{S}_{S}$^{K}	(12.4)$^{S}_{S}$^{K}	10.2^{K}	8.9^{K}	^{K}(7.8)$^{S}_{P}$	^{K}(6.6)$^{S}_{F}$	^{K}(6.0)$^{S}_{F}$	^{K}(4.0)$^{S}_{F}$
25	^{K}(2.6)$^{F}_{H}$	^{K}(2.1)$^{F}_{H}$	^{K}(2.4)$^{F}_{H}$	^{K}(2.3)$^{F}_{H}$	^{K}(2.5)$^{F}_{H}$	(2.5)$^{F}_{K}$	(2.2)$^{F}_{K}$	3.5^{F}	7.3^{F}	8.9^{F}	10.7	[12.1]^{C}	C	11.7	12.1	11.7	11.5	11.0	10.0	(8.7)$^{S}_{P}$	(7.0)$^{S}_{F}$	5.6^{F}	4.2	(3.7)$^{S}_{F}$
26	3.8^{F}	4.5^{F}	4.8^{F}	4.8^{F}	4.5	3.9	3.2	4.6^{F}	8.0	9.6	10.4	11.3	(12.0)^{S}	(11.3)^{P}	(11.6)$^{S}_{P}$	(11.8)$^{S}_{S}$	11.3	(10.2)$^{S}_{S}$	9.1	(8.0)$^{S}_{S}$	7.1	6.7	5.3	(5.5)^{S}
27	(5.5)^{S}	(5.5)$^{S}_{S}$	(5.9)$^{S}_{P}$	(5.5)$^{S}_{S}$	(5.2)^{P}	4.5	(3.9)$^{S}_{F}$	(5.0)^{F}	7.1^{Z}	9.7	(10.3)$^{S}_{S}$	11.6	11.2	10.7	10.7	10.3	(10.5)^{S}	(10.2)$^{S}_{P}$	7.3	(8.9)$^{S}_{P}$	6.7	(6.0)$^{S}_{P}$	(5.4)^{S}	4.5
28	4.7	4.9	5.2	4.9^{V}	4.6	(4.3)^{S}	(3.5)^{S}	4.9	8.0	9.0	10.5	11.2	11.5	11.7	(11.7)^{S}	(11.5)^{S}	(11.2)^{S}	(10.7)^{S}	9.1	(8.8)$^{S}_{S}$	(6.9)^{S}	(6.0)$^{S}_{P}$	5.3	4.7
29	(4.1)$^{S}_{S}$	[4.1]^{C}	4.2^{F}	(4.1)$^{S}_{S}$	(4.0)$^{S}_{S}$	(3.9)$^{S}_{S}$	(3.8)$^{S}_{S}$	5.0	7.7	9.0	10.1	11.5	11.1	10.7	10.2	11.0	(11.3)$^{S}_{P}$	(10.5)$^{S}_{P}$	9.4	8.4	(6.7)$^{S}_{S}$	(5.1)^{S}	(4.7)^{S}	(4.9)$^{S}_{P}$
30	4.8	4.5^{F}	4.7	4.4^{V}	3.7^{F}	3.9^{F}	4.4^{F}	5.7	8.4	9.4	9.8^{V}	10.0	11.7	11.5	(11.6)$^{S}_{S}$	(11.6)^{S}	11.4	10.8	10.0	9.2	(7.0)^{S}	5.4	(5.0)$^{S}_{S}$	(4.2)$^{S}_{S}$
31	4.2	4.3	4.3	4.2	4.1	(4.0)$^{S}_{S}$	(3.9)$^{S}_{S}$	4.8	8.4	9.4	10.9	(10.6)^{Z}	11.5	11.2	10.5	(10.6)^{S}	[10.4]^{M}	(10.2)$^{S}_{S}$	8.8	8.2	7.5	5.6	(4.9)$^{S}_{P}$	(4.6)^{P}
Median	(4.0)	(4.1)	4.4	4.4	4.2	3.8	3.6	4.2	7.2	9.0	10.1	11.3	11.3	11.1	11.0	10.8	(10.6)	10.1	8.8	7.5	(5.8)	(5.0)	(4.6)	(4.6)
Count	31	31	30	30	30	30	30	30	30	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 32

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

FoF2 (Characteristic), Mc (Unit), January (Month), 1950

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

National Bureau of Standards (Institution)

Scaled by: B.E.B, J.D., C.B.P.

75°W Mean Time

Calculated by: B.E.B, C.B.P.

Day	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330
1	(6.3)	(6.4)	(6.3)	5.0	4.5	4.5	4.3	5.9	(9.8)	(10.9)	(12.6)	(12.2)	11.8	11.2	(11.9)	(11.6)	(11.4)	(11.3)	(9.6)	(6.7)	(5.7)	(5.4)	(5.4)	(5.6)
2	(6.1)	(5.9)	(5.4)	(5.7)	4.7	5.0	4.8	[6.5]	9.6	12.1	12.6	(12.1)	(12.2)	12.5	(12.5)	(11.8)	(11.1)	(10.3)	8.8	(7.0)	(5.8)	(5.5)	(5.1)	(4.9)
3	4.9	(4.9)	4.9	(4.4)	4.3	4.3	4.1	(5.8)	(9.0)	(10.7)	12.4	12.3	11.6	11.5	(11.7)	11.0	(10.4)	(9.8)	(9.0)	(8.3)	(6.7)	(5.6)	(4.9)	(4.1)
4	(3.8)	(4.0)	(3.8)	[3.4]	3.4	3.7	4.1	(5.4)	(7.1)	11.6	12.0	(12.1)	12.0	12.4	12.6	(11.8)	(11.1)	(11.0)	(9.6)	(7.6)	(6.5)	(5.4)	3.8	3.5
5	3.3	3.7	4.2	4.4	4.0	3.8	3.4	(5.7)	8.8	11.1	(11.7)	11.7	[11.4]	11.0	(11.7)	(11.3)	(9.7)	(9.4)	8.2	6.3	(5.2)	(4.9)	(4.2)	(4.2)
6	(3.8)	(4.1)	4.2	(4.2)	(4.9)	(4.4)	(4.0)	(5.5)	7.9	10.2	12.0	12.5	11.3	11.5	(12.0)	(11.3)	(10.1)	(9.3)	(7.9)	(5.6)	5.2	5.0	5.0	(5.1)
7	5.3	5.4	5.4	5.2	(4.1)	(3.8)	(4.1)	5.7	8.0	(10.3)	(11.0)	(11.3)	10.9	10.9	(11.1)	10.5	(10.0)	9.3	(7.6)	5.4	(3.7)	(3.6)	(3.5)	(3.6)
8	(5.8)	(3.9)	4.2	3.7	[3.7]	3.8	3.6	(5.3)	(6.5)	10.5	(11.7)	10.8	9.7	(9.6)	9.5	9.6	9.4	7.3	(7.2)	(5.8)	4.4	(3.8)	(3.9)	(4.4)
9	(4.7)	5.2	5.7	5.3	4.0	3.4	3.7	(5.7)	7.8	9.7	11.3	11.4	10.8	10.4	10.4	10.0	(9.6)	8.9	8.2	(6.5)	(4.9)	(4.9)	(4.6)	(4.1)
10	(4.3)	(4.5)	4.9	(4.1)	3.9	3.8	3.6	(5.4)	7.4	(9.3)	10.7	10.8	10.5	10.4	10.7	(10.2)	(9.7)	9.5	(7.8)	6.6	5.5	4.7	4.6	4.4
11	4.6	C	C	C	3.7	C	C	C	C	(9.1)	10.8	11.6	11.4	(11.1)	(11.5)	10.7	(10.3)	[9.8]	8.6	(7.1)	(4.7)	4.7	(4.0)	(3.7)
12	(3.6)	4.3	3.8	4.5	3.8	3.3	2.8	4.8	6.7	8.5	10.4	10.4	10.5	10.2	10.7	(11.0)	(10.7)	(10.0)	8.3	(5.9)	(4.8)	(4.5)	(4.2)	(4.7)
13	4.8	(4.8)	(4.5)	(4.4)	(4.1)	2.9	(2.5)	(4.9)	7.0	7.8	9.4	9.9	9.7	9.9	10.4	(10.2)	9.6	(9.1)	(7.7)	(5.8)	(5.0)	(4.2)	(3.9)	(3.6)
14	(3.7)	(3.9)	4.4	4.4	4.2	(3.9)	(4.1)	(7.0)	7.5	(8.9)	10.3	12.0	11.4	10.9	9.9	(10.2)	10.2	8.4	(7.5)	(6.9)	4.4	3.6	(3.4)	3.5
15	3.2	3.5	(3.4)	3.5	3.5	3.3	3.2	(5.5)	(7.2)	8.4	9.5	10.1	10.3	(9.5)	(10.4)	(9.9)	10.0	9.0	7.9	(7.1)	(3.9)	3.2	2.9	3.1
16	3.2	3.3	(3.0)	2.5	2.8	2.9	3.2	5.5	7.3	8.1	(9.3)	10.7	C	C	C	(9.4)	[9.0]	(7.1)	(7.6)	5.4	[4.4]	(3.3)	(2.8)	(2.6)
17	(2.7)	(3.5)	(2.9)	(4.0)	3.9	(3.7)	3.3	5.2	7.3	7.9	9.9	9.3	9.5	9.5	(9.1)	(10.1)	(9.7)	(7.2)	(6.2)	(6.2)	(3.6)	3.0	2.8	(2.8)
18	3.0	(3.8)	(4.1)	4.5	4.0	3.5	3.6	5.5	(7.9)	(8.5)	9.9	(10.1)	8.9	8.8	9.4	(9.7)	9.1	7.5	7.0	(6.1)	(4.4)	3.2	2.8	2.9
19	3.3	3.8	(4.1)	(3.8)	3.6	(3.1)	3.1	5.5	7.6	8.0	9.5	11.1	11.3	10.8	(10.6)	(11.4)	10.3	10.0	(7.7)	(5.9)	(4.7)	(4.6)	(4.0)	(4.4)
20	(5.2)	5.3	(5.6)	(5.0)	(4.2)	(4.1)	3.1	5.8	(9.1)	8.8	10.8	11.8	11.6	(12.0)	11.0	11.4	10.2	(9.0)	(8.0)	(6.2)	(5.0)	(3.6)	(3.7)	(4.0)
21	(3.2)	3.5	3.8	3.2	3.2	3.1	3.1	(5.8)	8.1	(8.9)	9.6	10.5	11.3	11.3	(11.4)	10.7	10.7	(9.7)	(7.9)	(6.7)	4.7	3.5	(3.8)	(3.7)
22	3.4	(4.0)	4.5	4.5	3.9	3.6	3.6	(5.9)	8.4	(10.1)	10.6	10.7	11.0	(10.3)	9.8	(9.6)	9.6	8.0	7.4	(6.7)	4.8	(4.0)	(3.7)	(3.4)
23	(3.5)	(3.5)	3.8	(3.9)	3.2	2.7	2.9	5.6	8.0	9.0	(10.3)	9.7	10.7	11.0	10.6	10.8	10.6	8.7	7.7	7.0	(5.6)	5.0	5.3	4.9
24	5.0	4.7	(4.2)	(4.2)	3.7	3.8	(4.0)	6.7	8.2	9.4	10.7	11.9	11.0	11.4	(11.8)	(12.0)	(12.4)	10.8	9.2	8.2	7.0	(6.1)	(5.8)	3.2
25	(2.0)	(2.2)	(2.2)	(2.5)	(2.5)	(2.3)	(2.4)	5.8	8.6	10.1	11.4	12.8	[12.3]	11.8	11.5	11.3	10.8	10.6	(9.3)	7.1	5.0	(4.7)	(4.0)	(3.7)
26	[4.2]	4.6	4.9	4.7	(4.1)	3.6	3.3	(6.5)	8.4	8.6	10.5	11.8	11.5	(11.6)	(11.3)	(11.5)	(10.8)	9.2	8.4	(7.7)	(7.3)	5.4	5.3	5.5
27	(5.4)	(5.6)	5.6	(5.1)	4.8	(4.0)	(4.0)	6.3	(8.6)	9.7	10.8	12.0	11.0	10.9	10.0	10.5	(10.1)	(9.6)	(8.8)	8.3	6.3	(5.4)	(4.9)	(4.3)
28	4.7	5.2	5.0	4.8	4.4	4.1	3.3	6.6	(8.8)	(10.0)	10.8	11.2	12.0	11.9	(11.8)	(11.6)	(10.7)	10.0	9.0	(7.6)	6.7	5.5	(4.9)	4.5
29	(4.1)	(4.1)	(4.5)	4.0	(4.0)	(3.8)	(3.9)	6.3	8.6	9.8	10.9	11.2	10.7	10.0	10.8	11.3	(10.9)	10.1	(8.5)	7.3	(5.7)	5.0	(4.8)	4.9
30	4.4	4.5	4.5	4.0	3.2	4.2	(4.6)	6.8	8.3	10.6	11.0	11.6	11.8	12.0	11.8	11.3	11.4	10.0	9.8	(8.2)	(5.9)	5.0	4.5	4.1
31	(4.2)	4.3	4.3	[4.2]	4.1	(3.9)	4.0	6.9	(7.9)	9.8	10.7	11.0	(10.7)	10.8	10.8	10.6	[10.2]	9.7	8.8	(7.7)	6.7	5.1	(4.8)	4.6
Median	(4.2)	(4.2)	4.4	4.3	4.0	3.8	3.6	5.8	8.0	9.7	10.8	11.3	11.2	11.0	10.9	(10.8)	(10.2)	9.5	(8.2)	(6.7)	(5.0)	(4.7)	(4.2)	(4.1)
Count	31	30	30	30	31	30	30	30	30	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 33

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1948

IONOSPHERIC DATA

h' F1 (Characteristic), Km (Unit) January (Month), 1950

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat. 38.7°N, Long 77.1° W

75°W Mean Time

Scaled by: B.E.B., J.D., C.B.P.

Calculated by: B.E.B., C.B.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									Q	Q	Q	Q	Q	Q	Q	Q	Q							
2									Q	Q	Q	Q	Q	Q	Q	Q	Q							
3									Q	Q	Q	Q	Q	Q	210	Q	Q							
4									Q	Q	Q	Q	Q	Q	Q	Q	Q							
5									Q	Q	Q	Q	210	Q	Q	Q	Q							
6									Q	Q	Q	210	210	210	Q	Q	Q							
7									Q	Q	Q	Q	Q	Q	Q	Q	Q							
8									Q	Q	Q	Q	Q	Q	Q	Q	Q							
9									Q	Q	Q	200	Q	Q	Q	Q	Q							
10									Q	Q	Q	Q	Q	Q	200	Q	Q							
11									C	Q	Q	Q	210	Q	Q	Q	Q							
12									Q	Q	Q	Q	Q	200	Q	Q	Q							
13									Q	Q	Q	Q	Q	210	Q	Q	Q							
14									Q	Q	Q	220	Q	210	Q	Q	Q							
15									Q	Q	Q	Q	Q	Q	Q	Q	Q							
16									Q	Q	Q	Q	Q	C	Q	Q	Q							
17									Q	Q	Q	Q	Q	210	Q	Q	Q							
18									Q	Q	210	Q	210	200	Q	Q	Q							
19									Q	Q	Q	Q	Q	Q	220	Q	Q							
20									Q	T	T	210	Q	Q	Q	Q	Q							
21									Q	Q	Q	Q	210	Q	Q	Q	Q							
22									Q	Q	Q	Q	Q	Q	Q	Q	Q							
23									Q	Q	Q	Q	Q	Q	Q	Q	Q							
24									Q	Q	Q	Q	Q	Q	Q	Q	Q							
25									Q	Q	Q	C	C	Q	Q	Q	Q							
26									Q	Q	Q	Q	Q	Q	Q	Q	Q							
27									Q	Q	Q	Q	Q	Q	Q	Q	Q							
28									Q	Q	Q	Q	Q	Q	Q	Q	Q							
29									Q	Q	Q	Q	Q	Q	Q	Q	Q							
30									Q	Q	Q	Q	Q	Q	Q	Q	Q							
31									Q	Q	220	Q	Q	Q	Q	Q	M							
Median											—	—	210	210	—									
Count											2	4	5	6	3									

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

6

TABLE 34

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

foFl (Characteristic), Mc (Unit), January (Month), 1950

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat 38.7°N, Lang 77.1°W

75°W Mean Time

Scaled by: B.E.B, J.D, , C.B.P.

Calculated by: B.E.B, C.B.P,

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									Q	Q	Q	Q	Q	Q	Q	Q	Q							
2									Q	Q	Q	Q	Q	Q	Q	Q	Q							
3									Q	Q	Q	Q	Q	Q	L	Q	Q							
4									Q	Q	Q	Q	Q	Q	Q	Q	Q							
5									Q	Q	Q	Q	L	Q	Q	Q	Q							
6									Q	Q	Q	L	L	L	Q	Q	Q							
7									Q	Q	Q	Q	Q	Q	Q	Q	Q							
8									Q	Q	Q	Q	Q	Q	Q	Q	Q							
9									Q	Q	Q	L	Q	Q	Q	Q	Q							
10									Q	Q	Q	Q	Q	Q	L	Q	Q							
11									C	Q	Q	Q	L	Q	Q	Q	Q							
12									Q	Q	Q	Q	Q	L	Q	Q	Q							
13									Q	Q	Q	Q	Q	L	Q	Q	Q							
14									Q	Q	Q	L	Q	L	Q	Q	Q							
15									Q	Q	Q	Q	Q	Q	Q	Q	Q							
16									Q	Q	Q	Q	Q	C	Q	Q	Q							
17									Q	Q	Q	Q	Q	L	Q	Q	Q							
18									Q	Q	L	Q	L	L	Q	Q	Q							
19									Q	Q	Q	Q	Q	Q	L	Q	Q							
20									Q	T	T	L	Q	Q	Q	Q	Q							
21									Q	Q	Q	Q	L	Q	Q	Q	Q							
22									Q	Q	Q	Q	Q	Q	Q	Q	Q							
23									Q	Q	Q	Q	Q	Q	Q	Q	Q							
24									Q	Q	Q	Q	Q	Q	Q	Q	Q							
25									Q	Q	Q	C	C	Q	Q	Q	Q							
26									Q	Q	Q	Q	Q	Q	Q	Q	Q							
27									Q	Q	Q	Q	Q	Q	Q	Q	Q							
28									Q	Q	Q	Q	Q	Q	Q	Q	Q							
29									Q	Q	Q	Q	Q	Q	Q	Q	Q							
30									Q	Q	Q	Q	Q	Q	Q	Q	Q							
31									Q	Q	L	Q	Q	Q	Q	Q	M							
Median											—	—	—	—	—									
Count																								

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 35

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

h'E (Characteristic), Km (Unit) January (Month), 1950

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat 38.7°N, Lang. 77.1°W

75° W Mean Time

Scaled by: B.E.B., J.D., C.B.P.

Calculated by: B.E.B., C.B.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									130	110	100	100	S	S	100	100	110							
2									130	100	100	100	100	100	(100)S	100	100							
3									(100)A	(100)A	110	100	100	100	110	110	110							
4									120	110	100	100	(100)S	100	100	100	100							
5									B	(100)A	(100)A	100	(100)S	100	100	100	(100)A							
6									S	(100)A	110	110	100	100	100	100	(90)A							
7									B	100	S	S	S	(100)S	S	B	B							
8									(100)A	(100)A	100	100	100	(100)S	100	100	B							
9									B	(110)S	(100)S	[100]S	100	100	100	[100]C	100							
10									160	(110)A	(100)A	100	(100)A	(100)A	[100]B	110	120							
11									C	110	(100)A	(100)A	(100)A	(100)A	100	100	110							
12									120	100	100	(100)A	100	100	[100]C	110	110							
13									120	100	100	(100)A	(100)A	(100)A	100	100	110							
14									130	100	100	100	100	100	100	100	110							
15									130	[120]B	100	100	100	100	100	100	100							
16									130	100	100	100	100	[100]C	100	100	120							
17									B	100	100	100	100	100	100	100	100							
18									110	100	100	100	100	100	100	100	110							
19									130	110	100	100	100	100	100	100	(110)A							
20									110	T	T	100	100	100	100	100	110							
21									120	110	100	100	100	100	100	110	110							
22									(120)B	110	[110]B	100	110	110	110	110	120							
23									100	100	100	100	100	(110)S	110	100	100							
24									100	100	100	100	100	100	110	110	110K	(130)SK						
25									110	100	100	C	C	100	100	[100]C	100	(130)S						
26									(100)S	110	110	(110)B	110	100	100	100	110	(130)S						
27									120	110	110	100	110	100	100	100	100	(130)S						
28										110	100	100	100	100	100	110	C							
29									110	110	110	100	(100)B	100	110	100	110	130						
30										(110)C	110	100	110	110	(100)A	(100)A	110							
31									130	(110)B	110	110	110	110	(110)B	110	[120]M	130						
Median									120	100	100	100	100	100	100	100	110	(130)						
Count									23	30	29	29	28	30	30	30	28	6						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 36

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

foE (Characteristic), Mc (Unit), January (Month), 1950

Observed at Washington, D.C.

Lat. 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B.E.B, J.D., C.B.P.

Calculated by: B.E.B., C.B.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									1.9	2.6	2.9	3.2	(3.2)S	(3.1)S	3.0	2.7	(2.0)S							
2									1.9	2.6	2.9	3.1	3.1	3.1	(3.0)S	2.7	2.2							
3									2.0	2.5	(2.9)S	3.2	3.3	3.2	3.1	2.7	2.1							
4									1.9	2.4	2.8	3.1	3.1	3.1	(2.8)S	(2.6)S	2.2							
5									2.0	2.7	3.0	3.2	3.4	3.3	3.1	2.7	2.2							
6									2.0	2.5	3.0	3.2	3.3	3.3	3.1	2.7	A							
7									B	2.5	[2.8]S	(3.4)S	[3.2]S	(3.3)S	S	B	B							
8									2.1	2.7	2.9	(3.1)S	3.1	[3.0]S	3.0	2.7	B							
9									B	(2.4)B	(2.9)S	(3.1)S	3.3	S	S	C	2.2							
10									2.1	2.2	2.5	3.1	[3.2]A	(3.2)S	(2.9)B	2.5	2.3							
11									C	2.6	[2.8]A	(3.0)A	[3.2]A	(3.2)P	3.0	2.6	2.0							
12									1.9	2.5	3.0	(3.2)A	3.2	3.2	[3.0]C	2.8	2.1							
13									1.8	2.3	2.7	3.1	3.3	3.2	3.1	2.8	2.3							
14									1.8	(2.5)D	2.9	3.1	(3.2)F	3.1	3.0	2.9	2.3							
15									1.8	(2.5)B	3.0	3.1	3.3	3.2	2.9	2.9	2.4							
16									1.8	2.4	2.7	3.2	3.1	[3.0]C	2.9	(2.4)S	(2.3)S							
17									B	2.6	[2.8]B	3.1	3.3	3.2	3.0	2.7	2.3							
18									(2.0)D	(2.7)S	2.8	3.1	3.2	3.2	3.0	2.7	(2.4)S							
19									(2.1)B	2.5	(2.9)B	3.1	3.2	(3.3)S	3.0	(2.8)S	(2.4)A							
20									2.1	T	T	3.2	(3.4)B	(3.3)B	3.2	3.0	(2.4)S							
21									(2.1)D	2.5	3.1	3.3	3.4	3.3	3.1	2.8	2.5							
22									(2.1)S	2.7	[3.0]B	3.5	3.5	3.4	3.1	2.9	2.6							
23									2.0	2.8	3.1	3.3	3.3	3.5	3.3	3.0	2.4							
24									2.1	2.7	3.1	3.3	3.5	3.5	3.3	3.2	2.6K	1.9K						
25									(2.1)S	(2.9)F	3.2	C	C	3.6	3.5	3.1	2.6	1.8						
26									(2.2)D	2.9	3.2	(3.3)B	3.3	3.5	3.3	3.1	2.8	(1.7)S						
27									2.0	(2.6)B	3.0	3.2	3.2	3.3	3.3	3.0	2.6	1.8						
28										2.8	3.2	3.3	3.3	3.5	3.2	3.0	C							
29									2.2	2.8	3.2	3.4	(3.5)S	3.4	3.4	3.0	2.5	1.9						
30										(2.7)B	3.3	(3.3)S	(3.4)B	3.4	3.3	(2.9)A	2.4							
31									2.1	2.7	3.1	3.3	(3.4)B	3.3	3.3	3.0	[2.4]M	1.9						
Median									2.0	2.6	3.0	3.2	3.3	3.3	3.1	2.8	2.4	1.8						
Count									25	30	30	30	30	30	29	29	27	6						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 37

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

Es (Characteristic), Mc,Km (Unit) January (Month), 1950

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat. 38.7°N, Long 77.1°W

75°W Mean Time

Scaled by: B.E.B., J.D., C.B.P.

Calculated by: B.E.B., C.B.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	8.6/100	G	G	G	G	G	G	G
3	G	G	G	G	G	G	2.5/100	G	1.9/100	8.0/100	G	G	G	G	G	G	G	G	G	G	G	G	G	G
4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	7.8/100	G	G
5	G	G	G	G	2.6/110	G	3.6/100	G	G	2.3/100	2.5/100	G	G	G	G	G	7.6/100	G	G	G	G	G	2.2/100	C
6	G	G	G	2.8/100	G	G	G	2.3/100	G	1.9/100	G	G	G	G	G	G	2.5/90	G	G	G	G	G	G	G
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	2.1/100	G	G	G	G	G
8	G	G	G	G	G	G	G	G	2.0/100	2.2/100	G	G	G	G	G	G	G	G	G	G	G	G	G	G
9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	C	G	G	G	G	G	G	C	G
10	G	G	G	G	G	G	G	G	G	3.5/110	4.2/100	G	4.8/100	2.7/100	G	G	G	G	G	G	7.0/100	G	2.4/100	G
11	G	G	C	C	C	C	C	C	C	G	3.0/100	2.9/100	3.0/100	2.8/100	G	G	G	G	G	G	G	G	G	G
12	G	G	G	C	G	2.4/100	G	G	G	G	G	3.3/100	G	G	C	G	G	G	G	G	G	2.8/100	G	G
13	G	3.0/100	G	G	G	G	G	G	G	G	G	2.5/100	2.7/100	3.1/100	G	G	G	G	G	G	G	G	G	G
14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
15	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	G	G	G	G	G	C	G	G	G	G	G	G	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
18	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
19	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	2.8/110	G	G	G	G	G	G	G
20	G	G	G	G	G	G	G	G	G	T	T	G	G	G	G	G	G	G	G	G	G	G	G	G
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
22	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
23	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
25	G	G	G	G	G	G	G	G	G	G	G	C	C	G	G	G	G	G	G	G	G	G	G	G
26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	C	G	G	G	G	G	G	3.4/100
29	G	C	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	3.0/100	2.9/100	2.2/100	2.5/100	G	G	G	G	G	G
31	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	M	G	G	G	G	G	G	G
Median	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
Count	31	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	29	31	31	31	31	31	30	30

** MEDIAN fEs LESS THAN MEDIAN foE OR LESS THAN LOWER FREQUENCY LIMIT OF RECORDER

Sweep 1.0 Mc to 25.0 Mc in .025 min

Manual ☐ Automatic ☒

TABLE 38

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

(M1500)F2 , ____ January , 1950
(Characteristic) (Unit) (Month)

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W 75°W Mean Time

National Bureau of Standards
(Institution)

Scaled by: B.E.B., J.D., C.B.P.

Calculated by: B.E.B., C.B.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(1.8)J S	(1.8)J S	(2.0)J S	(2.0)J S	2.1 F	2.1 F	2.1 F	(2.1)S F	(2.0)J F	(2.3)S	2.2	2.1	(2.1)S	2.1	2.0	(2.1)J	(2.0)J S	(2.1)S P	(2.2)J	(2.2)S	(1.9)S F	(1.9)J S	(1.8)S F	(1.7)S P
2	(1.7)S P	(1.9)J S	(1.9)J S	(2.0)J P	2.0	1.8	(1.9)S P	2.1	2.3	2.2	2.3	2.2	2.1	(2.1)S	(2.0)S	(2.0)J P	(2.1)S	2.1	2.0	2.3	(2.0)J S	(2.0)S P	1.9	2.0
3	2.0	1.9	2.0	1.9	1.9	1.9	(2.0)S	2.0	2.4	2.4	(2.2)J	2.1	(2.1)J	2.0	(2.1)J	(2.1)S P	(2.2)J S	(2.1)S	(2.1)S P	(2.1)S P	(2.3)S P	(2.1)S P	(2.0)S P	(2.0)S
4	(2.0)J S	(1.9)S P	(1.8)S P	(2.0)S F	1.8 F	1.8 F	(1.9)S F	(2.1)S P	(2.3)S	2.1	2.2	2.2	2.0	(2.1)J S	2.0	(2.0)J S	(2.0)J S	2.0	2.2	(2.1)S	(2.1)J S	(2.0)J S	2.1	1.9 F
5	(1.9)F	(1.8)F	(2.0)S F	2.0 F	(2.0)F	1.9 F	2.1 F	2.0 F	2.3 F	2.3	2.2	2.2	2.1	2.1	(2.0)S	(2.1)J S	(2.1)J S	(2.1)S P	2.1	(2.2)S	2.1	(2.0)S P	(2.1)J S	(1.9)J F
6	(1.8)J S	S F	(1.9)S F	(2.0)S P	1.9 F	(2.0)S F	(2.0)S	1.9 F	(2.2)J S	2.1	2.2	2.1	2.1	2.0	2.0	(2.1)J S	(2.1)J	(2.2)J S	2.0	2.1	1.8	1.9	(1.9)J S	1.9
7	1.9	1.9	2.0	2.1	2.1	(1.9)J S	(1.9)J S	(2.0)J S	2.4	2.2	2.2	2.2	2.1	(2.1)P	(2.0)P	2.2	2.1	(2.2)J S	2.2	(2.2)J S	2.0 F	(1.9)J S	1.9	(1.8)S P
8	(1.8)J S	(2.0)J S	(2.1)S	(2.0)J S	(2.0)J S	2.0 F	(2.1)S P	2.1	2.4	2.0	(2.3)S P	2.3	2.2	2.2	2.2	2.2	(2.1)J S	2.3	(2.0)S P	2.1	2.0	(2.0)J	(1.8)J S	(1.8)J S
9	1.7	(1.8)F	1.8	2.0	2.2	1.8	1.8	(2.0)S P	2.3	2.1	(2.2)S P	2.3	2.0	2.1	2.2	2.1	2.2	2.1	2.1	2.4	(2.2)J S	(1.9)J S	C	2.0
10	(1.9)J F	(1.9)J S	1.9	2.1	1.9 F	1.9 F	1.9 F	1.8	(2.4)J S	(2.2)J S	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.1	2.0	2.0	1.9
11	1.9	1.9	C	C	C	C	C	C	C	2.3 F	(2.3)J S	2.2	2.2	2.0	2.1	2.1	(2.1)J	(2.1)S	(2.2)S P	2.2	2.3	1.9	(2.1)S	(1.8)J S
12	(1.8)S F	(1.8)S F	1.9 F	C	2.0 F	2.2 F	2.2 F	2.1 F	(2.4)S	2.3	2.2	2.2	2.2	2.2	(2.0)J H	(2.1)S	(2.1)S	2.1	2.1	(2.3)S	(2.0)S	(2.1)J S	(1.9)S	1.9
13	1.9	1.9	2.0	2.0	(2.0)S	2.2 F	2.1 Z	(1.9)S	2.3 F	2.4	2.0	2.3	2.2	2.1	2.0	2.1	(2.1)S P	2.1	(2.1)S P	(2.2)S P	2.1	1.9	(2.0)J S	(1.8)S
14	(1.9)J F	1.8 F	(1.8)J F	(1.9)S F	2.1	1.8 F	1.8 F	(2.0)S	2.3	2.2	2.1	2.0	2.1	2.1	(2.0)S P	2.0	2.1	2.2	2.1	(2.1)S P	2.2	(1.9)S	(1.9)J S	2.0
15	2.0	1.9	1.9 F	2.0 F	1.9	1.8	2.0 F	2.0 F	2.3	2.4	2.3	2.1	2.2	2.2	2.1	2.1	2.0	2.1	2.1	2.3 F	(2.4)S F	2.1 F	2.0 F	2.0 F
16	(1.8)S	(1.8)F	2.0 F	(2.0)J F	(2.0)V	2.0 F	2.0 F	2.1 F	2.5 F	2.4	2.2	(2.2)S	2.1	C	2.1	2.1	(2.3)J S	2.3	(2.0)J S	(2.2)S P	(2.2)J F	(1.9)F	(2.1)S F	(1.9)S F
17	(2.0)S F	(1.9)S F	(1.9)F	2.1 F	2.0 F	(2.0)J H	2.1 F	2.1	2.3	2.4	2.1	2.3	(2.2)S	2.2	(2.3)J S	(2.1)S P	(2.2)S P	2.3	(2.2)S P	2.2	2.2	2.1	1.9	(1.9)S P
18	1.8 F	(1.9)S F	(1.9)J F	2.0 F	(2.1)J S	1.9	1.9	(2.1)S	2.4	2.4	2.3	2.2	2.3	2.2	2.1	2.1	(2.1)S	2.4	2.1	2.2	(2.2)S P	2.2	1.9	(1.9)S
19	(1.8)S P	(1.7)S	(1.8)S	(2.1)J S	(1.9)S F	2.1 F	2.0 F	2.0 F	2.3	2.4	(2.1)J S	2.1	2.1	2.0	2.1	(2.0)S P	2.1	(2.1)J S	(2.1)S P	(2.1)S	2.0	(1.9)S F	(1.9)J F	(1.8)J S
20	(1.8)S F	(1.9)S F	(1.9)S F	2.2	(2.0)S F	2.0	(1.8)J H	1.9	(2.2)S	T	T	2.1	(2.0)J S	2.0	(2.1)J S	2.0	2.0	(2.2)J	2.0	2.1 F	(2.1)S F	(2.1)J S	(1.9)S F	(1.8)S F
21	(1.9)S F	1.7 F	1.9 F	2.0 F	1.8 F	1.9 F	1.8 F	(2.0)S F	2.2 F	2.3	2.2	2.2	2.1	2.0	2.0	2.1	(2.1)S	2.1	2.1	(2.1)S	(2.2)S F	(2.1)S F	(1.8)S F	(1.9)J F
22	1.8 F	(1.7)J S	1.7	2.0 F	2.0 F	1.9 F	2.0 F	2.0	2.2	2.4	2.3	2.2	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.1	2.1	(2.0)J	(1.8)S	1.9
23	(1.8)S	1.8	(1.8)J S	(2.1)J S	2.1	1.9	1.8	(2.0)S	2.2	2.3	2.1 V	2.3	(2.0)J	2.0	2.0	1.9	2.0	2.1	2.0	2.0	(2.0)S	1.8	(1.8)S	1.9
24	1.8	(2.0)S	2.0 F	(1.9)S F	1.8	1.8	1.8 F	2.0 F	2.2	2.2 F	2.0	1.9	(1.8)P	1.7	(1.8)J S	(1.9)J S	K(1.9)J S	K(1.9)J S	1.9 K	2.0 K	K(1.9)S P	K(1.7)S F	K(1.7)S F	K(1.8)S F
25	K(1.7)F H	K(1.9)F H	K(1.8)F H	K(1.7)F H	K(1.7)F H	(2.0)F K	(2.0)F K	2.0 F	2.4 F	2.3 F	2.1	C	C	1.9	1.9	1.9	2.0	2.0	2.0	(2.1)S P	(1.8)S F	2.0 F	1.9	(1.8)S F
26	1.8 F	1.7 F	1.9 F	2.0 F	2.0	2.1	1.9	1.9 F	2.4	2.3	2.2	2.0	(2.0)J	(2.0)P	(2.0)S F	(2.1)J S	1.9	(2.1)J S	1.9	(1.9)J S	2.0	1.7	1.8	(1.7)S
27	(1.7)S	(2.0)J S	(2.0)S P	(2.0)J S	(1.9)P	1.8	(1.8)J F	(1.9)F	2.1 Z	2.3	(2.2)J S	2.0	2.1	2.1	2.0	2.0	(2.1)S	(2.0)S P	1.8	(2.1)S P	1.9	(2.0)P S	(1.9)S	1.8
28	1.7	1.8	1.9	1.8 V	1.9	(2.0)J	(2.1)J	1.8	2.4	2.3	2.1	2.0	1.9	1.9	(1.9)S	(2.0)S	(2.0)S	(2.1)S	1.9	(2.0)J S	(1.9)S	(2.1)S P	2.0	1.8
29	(1.9)J S	C	1.9 F	(2.0)J S	(2.0)J S	(2.0)J S	(1.9)J S	2.0	2.3	2.2	2.1	2.1	2.0	2.1	2.0	2.0	(2.0)S P	(2.0)S P	2.0	2.1	(2.1)J S	(1.9)S	(1.9)J	(1.8)S P
30	1.8	1.8 F	1.8	1.8 V	1.7 F	1.7 Z	1.8 F	2.1	2.4	2.3	2.1 V	2.0	2.0	2.0	(2.0)J S	(2.0)S	2.0	2.1	2.0	2.1	(2.1)S	2.0	(2.0)J S	(1.9)J S
31	1.9	1.8	1.7	1.9	1.9	(1.9)J S	(1.9)J S	2.1	2.4	2.2	2.3	(2.1)Z	2.0	2.0	2.0	(1.9)S	M	(2.1)J Q	2.1	2.0	2.1	2.1	(1.9)S P	(1.9)P
Median	(1.8)	(1.9)	1.9	2.0	2.0	1.9	1.9	2.0	2.3	2.3	2.2	2.2	2.1	2.1	2.0	2.1	(2.1)	2.1	2.1	2.1	(2.1)	(2.0)	(1.9)	(1.9)
Count	31	29	30	29	30	30	30	30	30	30	30	30	30	30	31	31	30	31	31	31	31	31	30	31

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 39

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

(M3000)F2 (Characteristic), ____ (Unit), January (Month), 1950

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat 38.7°N, Lang 77.1°W

75°W Mean Time

Scaled by: B.E.B., J.D., C.B.P.

Calculated by: B.E.B., C.B.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(2.8)$^{J}_{S}$	(2.7)$^{J}_{S}$	(3.0)$^{J}_{S}$	(2.9)$^{J}_{S}$	3.3^{F}	3.3^{F}	3.2^{F}	(3.2)$^{S}_{F}$	(3.0)$^{J}_{F}$	(3.4)^{S}	3.3	3.2	(3.1)^{S}	3.1	3.0	(3.1)^{J}	(3.1)$^{J}_{S}$	(3.1)$^{S}_{P}$	(3.2)^{J}	(3.3)^{S}	(2.9)$^{S}_{F}$	(2.9)$^{J}_{S}$	(2.8)$^{S}_{F}$	(2.6)$^{S}_{P}$
2	(2.7)$^{S}_{P}$	(2.9)$^{J}_{S}$	(3.0)$^{S}_{F}$	(3.0)$^{J}_{P}$	2.9	2.8	(2.9)$^{S}_{P}$	3.1	3.3	3.3	3.3	3.2	3.1	(3.1)^{S}	(3.0)^{S}	(3.1)$^{J}_{P}$	(3.1)^{S}	3.2	3.2	3.3	(3.0)$^{J}_{S}$	(3.1)$^{S}_{F}$	2.9	2.9
3	3.0	2.9	3.0	3.0	2.9	2.8	(3.0)^{S}	3.0	3.4	3.6	(3.2)^{J}	3.2	(3.2)^{J}	3.0	(3.1)^{J}	(3.1)$^{S}_{P}$	(3.2)$^{J}_{S}$	(3.0)^{S}	(3.1)$^{S}_{P}$	(3.2)$^{S}_{P}$	(3.3)$^{S}_{P}$	(3.1)$^{S}_{P}$	(3.1)$^{S}_{P}$	(3.0)^{S}
4	(3.0)$^{J}_{S}$	(2.8)$^{S}_{P}$	(2.8)$^{S}_{P}$	(3.0)$^{S}_{F}$	2.8^{F}	2.8^{F}	(3.0)$^{S}_{F}$	(3.1)$^{S}_{P}$	(3.3)^{S}	3.3	3.3	3.2	3.0	(3.1)$^{J}_{S}$	3.0	(3.0)$^{S}_{J}$	(3.1)$^{J}_{S}$	3.2	3.2	(3.2)^{S}	(3.2)$^{J}_{S}$	(3.0)$^{J}_{S}$	3.2	2.9^{F}
5	(2.9)^{F}	(2.7)^{F}	(3.0)$^{S}_{F}$	2.9^{F}	(3.0)^{F}	2.9^{F}	3.2^{F}	3.0^{F}	3.3^{F}	3.4	3.2	3.2	3.1	3.1	(3.0)^{S}	(3.1)$^{J}_{S}$	(3.1)$^{J}_{S}$	(3.1)$^{S}_{P}$	3.2	(3.3)^{S}	3.2	(3.0)$^{S}_{P}$	(3.2)$^{J}_{S}$	(2.8)$^{J}_{F}$
6	(2.8)$^{J}_{S}$	S^{F}	(3.0)$^{S}_{F}$	(3.1)$^{S}_{F}$	2.9^{F}	(3.0)$^{S}_{F}$	(3.0)^{S}	2.9^{F}	(3.3)$^{J}_{S}$	3.2	3.2	3.2	3.1	3.0	3.0	(3.1)$^{J}_{S}$	(3.1)^{J}	(3.2)$^{J}_{S}$	3.0	3.2	2.8	2.9	(2.9)$^{J}_{S}$	2.8
7	2.9	3.0	3.0	3.2	3.1	(2.9)$^{J}_{S}$	(2.8)$^{J}_{S}$	(3.0)$^{J}_{S}$	3.5	3.3	3.3	3.3	3.2	(3.1)^{P}	(3.1)^{P}	3.2	3.1	(3.2)$^{J}_{S}$	3.3	(3.3)$^{J}_{S}$	2.8^{F}	(2.9)$^{J}_{S}$	2.9	(2.6)$^{S}_{P}$
8	(2.7)$^{J}_{S}$	(3.0)$^{J}_{S}$	(3.1)^{S}	(3.0)$^{J}_{S}$	(3.0)$^{J}_{S}$	3.0^{F}	(3.0)$^{S}_{P}$	3.0	3.5	3.0	(3.4)$^{S}_{P}$	3.4	3.3	·3.2	3.2	3.2	(3.2)$^{J}_{S}$	3.3	(3.0)$^{S}_{P}$	3.2	3.0	(2.9)^{J}	(2.8)$^{J}_{S}$	(2.7)$^{J}_{S}$
9	2.6	(2.8)^{P}	2.8	3.1	3.2	2.8	2.8	(3.0)$^{S}_{P}$	3.4	3.1	(3.2)$^{S}_{P}$	3.4	3.0	3.2	3.2	3.1	3.2	3.1	3.1	3.4	(3.2)$^{J}_{S}$	(2.9)$^{J}_{S}$	C	3.0
10	(2.8)$^{J}_{F}$	(2.9)$^{J}_{S}$	3.0	3.1	2.9^{F}	2.9^{F}	3.0^{F}	2.9	(3.5)$^{J}_{S}$	(3.3)$^{J}_{S}$	3.3	3.3	3.2	3.1	3.1	3.2	3.1	3.3	3.2	3.2	3.1	3.0	3.0	2.9
11	2.9	2.9	C	C	C	C	C	C	C	3.3^{F}	(3.3)$^{J}_{S}$	3.3	3.2	3.1	3.1	3.1	(3.1)^{J}	(3.0)^{S}	(3.2)$^{S}_{P}$	3.2	3.4	2.9	(3.1)^{S}	(2.8)$^{J}_{S}$
12	(2.7)$^{S}_{F}$	(2.8)$^{S}_{F}$	2.9^{F}	C	3.0^{F}	3.2^{F}	3.2^{F}	3.1^{F}	(3.5)^{S}	3.3	3.2	3.3	3.2	3.2	(3.0)$^{J}_{H}$	(3.1)^{S}	(3.1)^{S}	3.1	3.2	(3.3)^{S}	(3.1)^{S}	(3.2)$^{J}_{S}$	(2.8)^{S}	3.0
13	2.9	2.9	3.0	2.9	(3.0)^{S}	3.3^{F}	3.1^{Z}	(2.9)^{S}	3.3^{F}	3.4	3.1	3.3	3.2	3.1	3.0	3.1	(3.1)$^{S}_{P}$	3.1	(3.1)$^{S}_{P}$	(3.3)$^{S}_{P}$	3.1	2.9	(2.9)$^{J}_{S}$	(2.8)^{S}
14	(2.8)$^{J}_{F}$	2.7^{F}	(2.8)$^{J}_{F}$	(2.9)$^{S}_{F}$	3.1	2.8^{F}	2.8^{F}	(3.0)^{S}	3.4	3.4	3.1	3.0	3.0	3.1	(3.1)$^{S}_{P}$	3.0	3.1	3.2	3.1	(3.1)$^{S}_{P}$	3.3	(2.8)^{S}	(2.9)$^{S}_{S}$	3.0
15	3.0	2.8	2.9^{F}	3.0^{F}	2.9	2.8	3.0^{F}	3.0^{F}	3.4	3.5	3.4	3.2	3.2	3.2	3.1	3.1	3.1	3.1	3.1	3.3^{F}	(3.5)$^{S}_{F}$	3.1^{F}	3.0^{F}	3.0^{F}
16	(2.8)^{S}	(2.8)^{F}	2.9^{F}	(2.9)$^{J}_{F}$	2.9^{V}	3.0^{F}	3.0^{F}	3.1^{F}	3.5^{F}	3.5	3.2	(3.2)^{S}	3.1	C	3.1	3.2	(3.3)$^{J}_{S}$	3.4	(3.0)$^{J}_{F}$	(3.4)$^{S}_{P}$	(3.2)$^{J}_{F}$	(2.9)^{F}	(3.1)$^{S}_{F}$	(2.8)$^{S}_{S}$
17	(3.0)$^{S}_{F}$	(2.9)$^{S}_{F}$	(2.8)^{F}	3.1^{F}	3.0^{F}	(2.9)$^{J}_{H}$	3.0^{F}	3.1	3.5	3.5	3.2	3.4	(3.2)^{S}	3.2	(3.3)$^{J}_{S}$	(3.1)$^{S}_{P}$	(3.2)$^{S}_{F}$	3.4	(3.3)$^{S}_{F}$	3.3	3.2	3.1	2.9	(2.9)$^{S}_{S}$
18	2.7^{F}	(2.8)$^{S}_{F}$	(2.9)$^{J}_{F}$	3.0^{F}	(3.1)$^{J}_{S}$	3.0	2.9	(3.1)^{S}	3.4	3.5	3.4	3.2	3.4	3.3	3.2	3.1	(3.2)^{S}	3.3	3.1	3.3	(3.3)$^{S}_{S}$	3.2	2.8	(2.9)^{S}
19	(2.8)$^{S}_{S}$	(2.7)^{S}	(2.8)^{S}	(3.2)$^{J}_{S}$	(3.0)$^{S}_{F}$	3.2^{F}	2.9^{F}	3.0^{F}	3.4	3.6	(3.2)$^{J}_{S}$	3.1	3.1	3.0	3.1	(3.0)$^{S}_{P}$	3.1	(3.1)$^{S}_{S}$	(3.2)$^{S}_{P}$	(3.2)^{S}	3.0	(2.9)$^{S}_{F}$	(2.8)$^{J}_{F}$	(2.8)$^{J}_{S}$
20	(2.7)$^{S}_{F}$	(2.9)$^{S}_{F}$	(3.0)$^{S}_{P}$	3.3	(3.0)$^{S}_{F}$	3.0	(2.7)$^{J}_{H}$	2.8	(3.3)^{S}	T	T	3.1	(3.0)$^{J}_{S}$	3.0	(3.1)$^{J}_{S}$	3.0	3.1	(3.2)^{J}	3.0	3.1^{F}	(3.2)$^{S}_{S}$	(3.1)$^{S}_{S}$	(2.9)$^{S}_{S}$	(2.7)$^{S}_{F}$
21	(3.0)$^{S}_{F}$	2.6^{F}	2.9^{F}	3.0^{F}	2.7^{F}	2.9^{F}	2.7^{F}	(3.0)$^{S}_{F}$	3.3^{F}	3.4	3.3	3.2	3.1	3.0	3.1	3.1	(3.1)^{S}	3.2	3.1	(3.2)^{S}	(3.2)$^{S}_{F}$	(3.1)$^{S}_{S}$	(2.8)$^{S}_{F}$	(3.0)$^{J}_{F}$
22	2.6^{F}	(2.7)$^{S}_{S}$	2.7	3.1^{F}	2.9^{F}	2.9^{F}	3.0^{F}	3.0	3.4	3.4	3.3	3.3	3.0	3.1	3.0	3.0	3.1	3.2	3.0	3.1	3.1	(3.0)^{J}	(2.8)^{S}	2.9
23	(2.7)^{S}	2.7	(2.8)$^{S}_{S}$	(3.1)$^{S}_{S}$	3.1	2.8	2.7	(2.9)^{S}	3.3	3.4	32^{V}	3.4	(3.0)^{J}	2.9	3.0	2.9	3.0	3.1	3.0	3.0	(3.1)^{S}	2.8	(2.8)^{S}	2.9
24	2.8	(3.0)^{S}	3.0^{F}	(2.9)$^{S}_{F}$	2.8	2.8	2.8^{F}	3.0^{F}	3.3	3.2^{F}	3.0	2.8	(2.9)^{P}	2.6	(2.7)$^{S}_{S}$	(2.8)$^{S}_{S}$	K(2.8)$^{S}_{S}$	K(2.9)$^{S}_{S}$	2.9 K	2.9 K	K(2.9)$^{S}_{F}$	K(2.7)$^{S}_{F}$	K(2.7)$^{S}_{P}$	K(2.7)$^{S}_{F}$
25	K(2.7)$^{F}_{H}$	K(2.9)$^{F}_{H}$	K(2.7)$^{F}_{H}$	K(2.7)$^{F}_{H}$	K(2.6)$^{F}_{H}$	(2.9)$^{F}_{K}$	(3.0)$^{S}_{K}$	3.1^{F}	3.4^{F}	3.2^{F}	3.2	C	C	3.0	2.9	2.9	3.0	3.0	3.0	(3.1)$^{S}_{P}$	(2.7)$^{S}_{S}$	3.0^{F}	2.9	(2.8)$^{S}_{F}$
26	2.7^{F}	2.6^{F}	2.8^{F}	3.0^{F}	3.0	3.1	2.9	2.8^{F}	3.5	3.3	3.3	3.1	(2.9)^{J}	(2.9)^{P}	(3.0)$^{S}_{F}$	(3.1)$^{J}_{S}$	3.0	(3.1)$^{J}_{S}$	3.0	(2.9)$^{J}_{S}$	3.1	2.5	2.7	(2.6)^{S}
27	(2.6)^{S}	(2.8)$^{S}_{S}$	(2.9)$^{S}_{P}$	(3.0)$^{J}_{S}$	(2.9)^{P}	2.8	(2.8)$^{S}_{F}$	(2.9)^{F}	3.2^{Z}	3.3	(3.2)$^{J}_{S}$	3.0	3.1	3.2	3.0	3.1	(3.0)^{S}	(3.0)$^{S}_{P}$	2.8	(3.1)$^{S}_{F}$	2.8	(2.9)$^{S}_{F}$	(2.9)^{S}	2.7
28	2.5	2.7	2.9	2.8^{V}	2.8	(3.0)^{J}	(3.1)^{J}	2.7	3.5	3.3	3.1	3.0	2.8	2.9	(2.8)^{S}	(2.9)^{S}	(3.0)^{S}	(3.0)^{S}	3.0	(3.1)$^{S}_{S}$	(2.8)^{S}	(3.1)$^{S}_{P}$	3.0	2.7
29	(2.8)$^{S}_{S}$	C	2.8^{F}	(2.9)$^{J}_{S}$	(2.9)$^{J}_{S}$	(3.0)$^{J}_{S}$	(2.9)$^{J}_{S}$	3.0	3.3	3.3	3.1	3.1	3.0	3.2	2.9	3.0	(2.9)$^{S}_{P}$	(3.0)$^{S}_{P}$	3.0	3.1	(3.1)$^{S}_{S}$	(2.9)^{S}	(2.8)^{J}	(2.8)$^{S}_{P}$
30	2.7	2.7^{F}	2.7	2.8^{V}	2.7^{F}	2.6^{F}	2.7^{F}	3.2	3.5	3.4	3.3^{V}	3.2	3.0	3.0	(3.0)$^{J}_{S}$	(3.0)^{S}	3.0	3.1	3.0	3.2	(3.2)^{S}	3.1	(3.0)$^{S}_{S}$	(2.9)$^{J}_{S}$
31	2.6	2.7	2.8	2.9	2.8	(2.9)$^{J}_{S}$	(2.8)$^{J}_{S}$	3.1	3.6	3.2	3.4	(3.1)^{Z}	3.0	3.0	3.0	(3.0)^{S}	M	(3.1)$^{J}_{S}$	3.1	3.0	3.2	3.2	(2.9)$^{S}_{P}$	(2.8)^{F}
Median	(2.8)	(2.8)	2.9	3.0	2.9	2.9	3.0	3.0	3.4	3.3	3.2	3.2	3.1	3.1	3.0	3.1	(3.1)	3.1	3.1	3.2	(3.1)	(3.0)	(2.9)	(2.8)
Count	31	29	30	29	30	30	30	30	30	30	30	30	30	30	31	31	30	31	31	31	31	31	30	31

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 40

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

(M3000)F1 (Characteristic), ____ (Unit), January (Month), 1950

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat. 38.7°N, Lang. 77.1°W

75°W Mean Time

Scaled by: B.E.B., J.D., C.B.P.

Calculated by: B.E.B., C.B.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									Q	Q	Q	Q	Q	Q	Q	Q	Q							
2									Q	Q	Q	Q	Q	Q	Q	Q	Q							
3									Q	Q	Q	Q	Q	Q	L	Q	Q							
4									Q	Q	Q	Q	Q	Q	Q	Q	Q							
5									Q	Q	Q	Q	L	Q	Q	Q	Q							
6									Q	Q	Q	L	L	L	Q	Q	Q							
7									Q	Q	Q	Q	Q	Q	Q	Q	Q							
8									Q	Q	Q	Q	Q	Q	Q	Q	Q							
9									Q	Q	Q	L	Q	Q	Q	Q	Q							
10									Q	Q	Q	Q	Q	Q	L	Q	Q							
11									C	Q	Q	Q	L	Q	Q	Q	Q							
12									Q	Q	Q	Q	Q	L	Q	Q	Q							
13									Q	Q	Q	Q	Q	L	Q	Q	Q							
14									Q	Q	Q	L	Q	L	Q	Q	Q							
15									Q	Q	Q	Q	Q	Q	Q	Q	Q							
16									Q	Q	Q	Q	Q	C	Q	Q	Q							
17									Q	Q	Q	Q	Q	L	Q	Q	Q							
18									Q	Q	L	Q	L	L	Q	Q	Q							
19									Q	Q	Q	Q	Q	Q	L	Q	Q							
20									Q	T	T	L	Q	Q	Q	Q	Q							
21									Q	Q	Q	Q	L	Q	Q	Q	Q							
22									Q	Q	Q	Q	Q	Q	Q	Q	Q							
23									Q	Q	Q	Q	Q	Q	Q	Q	Q							
24									Q	Q	Q	Q	Q	Q	Q	Q	Q K							
25									Q	Q	Q	C	C	Q	Q	Q	Q							
26									Q	Q	Q	Q	Q	Q	Q	Q	Q							
27									Q	Q	Q	Q	Q	Q	Q	Q	Q							
28									Q	Q	Q	Q	Q	Q	Q	Q	Q							
29									Q	Q	Q	Q	Q	Q	Q	Q	Q							
30									Q	Q	Q	Q	Q	Q	Q	Q	Q							
31									Q	Q	L	Q	Q	Q	Q	Q	M							
Median											—	—	—	—	—									
Count																								

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U.S. GOVERNMENT PRINTING OFFICE: 1946 O - 702519

TABLE 41

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

(M1500) E (Characteristic), ____ (Unit), January (Month), 1950

Observed at Washington, D.C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B.E.B., J.D., C.B.P.

Calculated by: B.E.B., C.B.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									3.8	4.0	4.1	4.1	(4.5)S	(4.4)S	4.4	4.4	(4.4)S							
2									3.9	4.0	4.1	4.3	4.4	4.2	(4.3)S	4.4	4.4							
3									3.5	4.1	(4.2)S	4.1	4.2	4.3	4.3	4.3	4.3							
4									4.2	4.2	4.5	4.0	4.0	4.2	(4.3)S	(4.2)S	4.1							
5									3.9	3.9	4.0	4.1	3.9	4.3	4.2	4.5	4.2							
6									3.5	4.0	4.0	4.0	4.2	4.2	4.1	4.3	A							
7									B	4.1	S	(4.1)S	S	(4.2)S	S	B	B							
8									3.7	3.9	4.1	(4.3)S	4.2	S	4.0	4.3	B							
9									B	(4.2)B	(3.9)S	S	4.2	S	S	C	4.3							
10									3.7	4.1	4.3	4.2	A	(4.1)S	(4.2)B	4.3	4.2							
11									C	4.2	A	(4.4)A	A	(4.2)B	4.3	4.6	4.3							
12									4.0	4.4	4.1	(4.1)A	4.2	4.1	C	4.2	4.2							
13									4.4	4.4	4.4	4.2	4.1	4.3	4.2	4.3	4.4							
14									4.3	(4.3)B	4.1	4.2	(4.4)B	4.4	4.3	4.3	4.0							
15									4.1	(4.2)B	4.1	4.2	4.2	4.3	4.6	4.2	4.2							
16									3.9	4.3	4.2	3.9	4.3	C	4.1	(4.4)S	(4.1)S							
17									B	4.2	B	3.9	3.9	4.1	4.4	4.1	4.0							
18									(4.2)B	(4.6)S	4.5	4.2	4.3	4.4	4.3	4.3	(4.2)S							
19									(3.8)B	3.8	(4.1)B	4.2	4.1	(4.0)S	4.3	(4.3)S	(4.2)A							
20									4.4	T	T	4.4	(4.3)B	(4.1)B	4.2	4.1	(4.3)S							
21									(4.2)B	4.5	4.5	4.2	4.1	4.3	4.5	4.3	4.0							
22									(4.1)S	4.4	B	4.2	4.1	4.2	4.3	4.4	4.1							
23									4.0	4.3	4.2	4.2	4.2	4.2	4.5	4.4	4.5							
24									4.3	4.2	4.3	4.3	4.1	4.0	3.9	4.1	4.2K	3.7K						
25									(4.3)S	(4.0)B	4.1	C	C	4.1	4.1	4.4	4.2	3.9						
26									(4.4)B	4.2	4.1	(4.2)B	4.0	4.0	4.3	4.2	3.9	(4.1)S						
27									4.0	(4.2)B	4.3	4.1	4.4	4.5	4.2	4.2	4.2	3.9						
28										4.2	4.2	4.4	4.4	4.4	4.5	4.2	C							
29									4.3	4.3	4.4	4.4	(4.3)B	4.4	4.2	4.4	4.3	3.7						
30										(4.3)B	4.4	(4.2)S	(4.1)B	4 4	4.2	(4.4)B	4.4							
31									4.1	4.1	4.2	4.2	(4.1)B	4.4	4.2	4.3	M	3.8						
Median									4.1	4.2	4.2	4.2	4.2	4.2	4.3	4.3	4.2	3.8						
Count									25	30	26	29	27	28	28	29	26	6						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Table 42

Ionospheric Storminess at Washington, D. C.

January 1950

Day	Ionospheric character* 00-12 GCT	12-24 GCT	Principal storms Beginning GCT	End GCT	Geomagnetic character** 00-12 GCT	12-24 GCT
1	2	0			2	2
2	1	0			2	0
3	1	2			1	1
4	2	0			2	2
5	3	2			2	1
6	2	2			2	2
7	1	2			2	2
8	2	2			1	0
9	2	1			2	2
10	1	2			2	2
11	1	2			2	2
12	2	1			2	1
13	1	2			2	2
14	2	3			3	3
15	3	1			1	2
16	3	3			3	2
17	3	3			1	1
18	3	3			1	1
19	3	1			2	2
20	1	2			3	2
21	2	3			3	3
22	2	1			2	1
23	2	1			3	2
24	1	2	2100	----	3	4
25	4	1	----	1200	4	2
26	2	0			2	2
27	2	1			2	2
28	1	1			2	1
29	1	2			1	1
30	2	2			4	2
31	2	1			1	2

*Ionosphere character figure (I-figure) for ionospheric storminess at Washington, D. C., during 12-hour period, on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

**Average for 12 hours of Cheltenham, Maryland, geomagnetic K-figures on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

----Indicate continuing storm.

Table 43

Sudden Ionosphere Disturbances Observed at Washington, D. C.

January 1950

1950 Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
January 20	1635	1715	Ohio, D. C., England	0.03	Terr.mag.pulse** 1630-1800
21	1415	1520	Ohio, D. C., England	0.1	
22	1455	1525	Ohio, D. C., England	0.05	

*Ratio of received field intensity during SID to average field intensity before and after, for station KQ2XAU (formerly W8XAL), 6080 kilocycles, 600 kilometers distant.

**As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

Table 44

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief, Cable and Wireless, Ltd., as Observed in Barbados, B.W.I.

1949 Day	GCT Beginning	GCT End	Location of transmitters
December 12	1300	1330	British Guiana, England, Jamaica

Table 45

Sudden Ionosphere Disturbances Reported by RCA Communications, Inc. as Observed at Point Reyes, California

1950 Day	GCT Beginning	GCT End	Location of transmitters
January 20	2317	2350	Australia, China, Chosen, Japan, Java, Philippine Is.

Note: Observers are invited to send to the CRPL information on times of beginning and end of sudden ionosphere disturbances for publication as above. Address letters to the Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

Table 46

Sudden Ionosphere Disturbances Reported by Institut für Ionosphärenforschung, as Observed at Lindau, Harz, Germany, November 1949

1949 Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
November					
5	1158	1210	Berlin, Lindau**	0.1	Terr.mag.pulse*** 1130-1150
7	1030	1055	Lindau**		
9	1428	1435	Berlin	0.1	
17	0940	0955	Berlin, Lindau**	0.03	
17	1100	1440	Berlin, Lindau**	0.01	
19	1030	1145	Berlin, Lindau**	0.0	Terr.mag.pulse*** 1112-1135
20	1008	1020	Berlin	0.1	Terr.mag.pulse*** 0945-1015
20	1025	1032	Berlin	0.2	
23	0847	0858	Berlin	0.4	
24	0920	0930	Berlin	0.4	

*Ratio of received field intensity during SID to average field intensity before and after, for station Voice of America, 6078.9 kilocycles, 200 km distant.

**Lindau station 1780 kilocycles pulse, transmitter and receiver at Lindau.

***Time of observation at Lindau.

Table 47

Provisional Radio Propagation Quality Figures
(Including Comparisons with CRPL Warnings and Forecasts)
December 1949

Day	North Atlantic quality figure Half day GCT (1)	(2)	CRPL* Warning Half day GCT (1)	(2)	CRPL Forecast (J-reports)	North Pacific quality figure Half day GCT (1)	(2)	Geomagnetic K_{Ch} Half day GCT (1)	(2)
1	5	6	W			5	6	2	0
2	6	6				6	6	2	0
3	7	7				5	7	1	2
4	7	6				7	7	2	2
5	7	6				6	6	2	2
6	7	7				6	7	2	2
7	6	7				6	6	1	1
8	7	7				6	6	1	2
9	5	6	W	(U)		6	7	3	3
10	6	5				6	5	1	1
11	6	6				5	5	1	0
12	6	7				5	6	0	0
13	7	7				6	6	1	1
14	7	7				5	6	2	3
15	7	7				6	7	2	1
16	6	7				6	7	2	1
17	7	6				7	7	2	1
18	7	6				7	7	1	1
19	7	6				6	6	1	1
20	6	6				6	6	2	1
21	6	7				5	6	2	2
22	7	7				6	6	2	1
23	7	6				6	6	1	2
24	6	5				6	7	(4)	1
25	6	6				6	7	2	1
26	7	7				6	7	2	1
27	7	7				6	6	1	1
28	7	6				7	6	2	2
29	6	7				6	6	1	2
30	7	7				6	7	1	2
31	7	6				7	7	2	3

Scales:
Quality Figures
(1)- Useless
(2)- Very poor
(3)- Poor
(4)- Poor to fair
5 - Fair
6 - Fair to good
7 - Good
8 - Very good
9 - Excellent

Geomagnetic K_{Ch} - 0 to 9, 9 representing the greatest disturbance; $K_{Ch} \geq 4$ indicates significant disturbance, enclosed in ( ) for emphasis.

Symbols:
W Disturbed conditions expected
U Unstable conditions expected
N No disturbance expected
X Probable disturbed date

Scoring:
H Storm ($Q \leq 4$) hit
(M) Storm severer than predicted
M Storm missed
G Good day forecast
O Overwarning

Scoring by half day according to following table:

	Quality Figure ≤3	4	5 ≥ 6	
W	H	H	O	O
U	(M)	H	H	O
N	M	M	G	G
X	H	H	O	O

Score:	Warning N.A.	N.P.	Forecast N.A.	N.P.
H	0	0	0	0
(M)	0	0	0	0
M	0	0	0	0
G	59	59	62	62
O	3	3	0	0

*Broadcast on WWV, Washington, D.C. Times of warnings recorded to nearest half day as broadcast. ( ) broadcast for one-quarter day. Blanks signify N.

Table 48

American and Zürich Provisional Relative Sunspot Numbers

January 1950

Date	R_A*	R_Z**	Date	R_A*	R_Z**
1	122	101	17	110	78
2	109	100	18	129	92
3	99	92	19	177	107
4	98	84	20	182	130
5	95	76	21	183	155
6	97	85	22	202	163
7	86	84	23	193	146
8	74	86	24	216	157
9	86	64	25	223	136
10	88	83	26	189	124
11	84	70	27	149	108
12	75	67	28	148	109
13	89	65	29	120	98
14	85	71	30	108	118
15	96	70	31	97	80
16	92	65	Mean:	125.8	98.8

*Combination of reports from 43 observers; see page 8.

**Dependent on observations at Zürich Observatory and its stations at Locarno and Arosa.

Table 49a

Coronal observations at Climax, Colorado (5303A), east limb

Date GCT	Degrees north of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees south of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1950																																				
Jan. 4.7	-	-	-	-	-	-	-	-	-	1	2	1	28	31	32	29	35	38	21	17	28	32	20	19	14	13	9	2	-	-	-	-	X	X	X	X	X
6.7	-	-	-	-	-	-	-	-	1	-	1	3	9	12	11	13	13	20	19	24	28	16	16	13	4	1	2	2	-	1	-	-	-	-	-	-	-
7.7	-	-	-	-	-	-	-	-	-	-	-	4	13	14	15	15	19	22	17	24	19	14	14	11	6	4	2	2	1	2	1	-	-	-	-	-	-
8.7	X	X	X	X	X	X	X	-	-	-	-	3	5	9	11	13	13	14	13	14	11	11	12	9	7	4	2	-	-	-	-	-	-	-	-	-	-
10.7	2	-	1	2	-	2	2	2	4	2	3	4	6	11	15	19	24	32	15	13	18	18	13	14	14	9	5	4	3	3	5	3	2	2	1	1	-
11.7	-	-	-	-	-	-	-	2	3	4	5	7	8	5	11	15	18	17	15	13	23	19	15	13	12	9	4	4	3	4	4	4	3	3	2	-	-
16.8	-	-	-	-	-	-	2	3	5	6	5	4	8	10	13	14	15	11	8	6	4	4	6	7	9	9	7	7	9	4	6	7	8	6	3	-	-
20.7a	X	-	-	3	3	3	5	6	4	4	9	13	13	20	19	20	14	13	13	12	12	9	8	6	4	5	5	5	5	2	2	X	X	X	X	X	X
26.8	-	1	4	4	3	2	2	3	3	4	9	10	12	16	23	21	18	17	18	18	20	18	14	9	6	8	5	6	4	4	3	-	-	-	-	-	-

Table 50a

Coronal observations at Climax, Colorado (6374A), east limb

Date GCT	Degrees north of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees south of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1950																																				
Jan. 4.7	-	-	-	-	-	-	-	-	-	3	5	11	16	12	27	3	4	13	10	11	13	7	3	5	2	4	2	1	3	3	3	X	X	X	X	X	X
6.7	5	3	2	1	-	2	3	3	4	3	2	12	12	4	-	1	2	7	8	21	8	9	-	1	2	2	3	2	1	1	1	1	1	1	2	2
7.7	2	2	2	2	4	4	6	6	3	4	9	10	1	1	3	4	2	11	20	27	17	9	12	-	2	1	1	2	2	2	2	3	2	2	3	1	1
8.7	X	X	X	X	X	X	X	3	3	3	4	3	-	-	-	-	-	6	11	11	3	3	5	3	2	-	1	1	1	2	1	2	2	2	2	3	2
10.7	4	5	3	4	5	4	3	2	2	2	2	2	1	1	-	9	6	14	11	12	18	12	3	2	2	2	4	1	1	4	3	4	4	2	2	2	2
11.7	6	5	4	4	4	3	2	2	1	-	-	-	1	-	-	-	4	14	7	13	16	8	3	-	-	-	-	-	1	-	-	-	-	-	-	-	-
16.8	2	2	-	-	-	-	3	2	3	4	-	-	2	4	6	4	9	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
20.7a	X	-	-	-	-	-	-	-	-	-	-	-	12	4	18	13	11	2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X
26.8	2	3	4	3	2	2	3	2	2	3	3	3	-	-	5	5	12	10	7	1	5	4	4	2	4	1	-	-	-	-	-	-	-	-	-	-	-

Table 51a

Coronal observations at Climax, Colorado (6704A), east limb

Date GCT	Degrees north of the solar equator 90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	Degrees south of the solar equator 5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1950																																				
Jan. 4.7	-	-	-	1	1	1	-	-	1	-	-	-	-	4	4	2	3	3	2	2	2	1	2	1	1	1	1	-	-	-	-	X	X	X	X	X	X
6.7	-	-	1	-	-	-	-	-	-	1	-	-	-	-	1	1	1	1	1	3	3	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	2	2	2	3	3	2	2	2	-	-	-	-	-	-	-	1	1	1	-	-	-
8.7	X	X	X	X	X	X	X	-	-	-	2	-	-	2	2	1	1	2	4	1	1	1	1	1	1	-	-	1	2	2	-	1	1	2	1	1	-
10.7	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	2	2	1	1	1	1	1	1	1	-	-	-	-	1	1	2	-	-	1	1	-
11.7	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	2	-	-	1	1	2	1	1	1	1	2	-	-	2	2	1	1	1	1	1	1
16.8	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	1	1	1	1	1	-	1	1	1	1	2	1	1	1	1	1	2	2	1	-	-
20.7a	X	-	-	-	1	-	-	-	-	1	1	2	2	3	2	2	2	1	1	2	2	1	1	1	-	-	1	1	1	1	-	X	X	X	X	X	X
26.8	2	2	1	1	1	1	1	-	-	-	1	1	-	4	4	3	2	2	3	3	3	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 49b

Coronal observations at Climax, Colorado (5303A), west limb

Date GCT	Degrees south of the solar equator																		0°	Degrees north of the solar equator																
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1950																																					
Jan. 4.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
6.7	-	1	1	4	5	3	5	4	4	7	8	8	9	10	9	9	9	13	13	12	12	15	19	22	28	26	16	4	3	2	2	2	3	-	1	1	-
7.7	-	-	2	2	3	4	4	4	4	5	9	9	9	7	11	11	12	16	15	16	16	24	28	29	32	31	15	8	5	4	3	2	2	2	1	-	-
8.7	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.7	-	-	-	-	1	1	2	3	3	6	7	4	5	11	13	12	13	15	11	12	13	15	12	14	13	11	10	8	2	2	1	-	-	-	-	-	2
11.7	-	-	2	2	-	-	4	9	6	4	4	5	8	10	12	13	17	16	14	13	14	15	13	13	11	10	7	4	-	-	-	X	X	X	X	X	-
16.8	-	-	-	-	-	-	X	X	X	X	-	2	3	3	4	8	9	9	10	11	12	16	16	11	10	9	3	3	-	-	-	-	-	-	-	-	-	-
20.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26.8	-	-	-	-	-	3	3	4	4	4	5	8	9	11	12	15	18	16	16	15	18	29	22	16	10	9	9	9	8	6	4	3	2	1	1	1	-

Table 50b

Coronal observations at Climax, Colorado (6374A), west limb

Date GCT	Degrees south of the solar equator																		0°	Degrees north of the solar equator																
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1950																																					
Jan. 4.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
6.7	2	-	2	1	1	1	1	1	1	-	-	1	1	1	1	-	-	-	-	-	1	7	9	5	12	11	-	-	-	-	-	1	-	-	1	1	5
7.7	1	2	2	1	1	3	-	-	-	-	-	1	1	1	1	-	-	-	1	1	10	19	18	11	15	8	4	1	-	-	-	1	2	2	2	2	2
8.7	2	2	2	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.7	2	2	4	2	4	3	1	1	1	1	-	-	-	-	-	-	-	1	6	2	4	-	-	-	3	3	2	1	1	1	1	1	1	1	1	1	4
11.7	-	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	2	3	9	3	10	-	-	-	-	2	2	-	-	5	X	X	X	X	X	X	6
16.8	-	-	2	2	1	1	X	X	X	X	-	-	-	-	-	-	-	-	-	12	5	4	4	1	2	2	2	2	3	3	2	-	-	3	2	1	2
20.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26.8	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	10	13	6	4	5	12	10	10	8	-	-	-	-	2	2	4	4	2	2	4	2

Table 51b

Coronal observations at Climax, Colorado (6704A), west limb

Date GCT	Degrees south of the solar equator																		0°	Degrees north of the solar equator																
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1950																																					
Jan. 4.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-
6.7	-	-	-	1	-	-	-	-	-	1	1	-	2	1	-	1	-	1	2	2	2	2	3	3	3	1	1	-	1	1	1	1	-	-	-	-	-
7.7	-	-	-	-	-	-	-	1	1	1	1	1	1	-	-	-	1	1	1	2	2	2	4	4	3	2	2	-	-	1	1	1	-	-	-	-	-
8.7	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.7	-	-	-	-	-	-	-	-	-	-	-	1	-	1	1	1	1	1	-	-	1	2	2	1	1	2	-	-	1	1	-	-	-	-	-	-	-
11.7	1	1	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	3	1	1	2	2	1	1	2	1	1	1	1	1	1	1	X	X	X	X	X	-
16.8	-	-	-	-	-	X	X	X	X	X	-	-	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	1	1	-	-	-	-	-	-
20.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26.8	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	2	2	1	3	3	2	1	1	1	-	-	-	-	-	-	-	-	1	2

Table 52.-- Geomagnetic planetary three-hour-range indices Kp

	January 1941									February 1941									March 1941								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	1o	3-	2+	1-	3+	4+	4o	4-	22o	0o	0+	1o	1+	2+	2+	2o	1o	10+	3o	6+	8o	8o	9-	9o	9-	7o	59-
2	3-	2-	1o	1+	3-	2+	1-	1+	14-	1-	1o	1+	2-	2-	1-	3o	3o	13o	5+	4o	5-	5-	3+	5-	4o	4+	35o
3	1o	1-	1+	1o	1+	1-	2o	3+	11+	3o	4+	5-	4+	3+	3-	3+	3+	29o	4-	4-	3o	4+	4o	5+	4+	2-	30o
4	3+	3+	2o	2o	0+	1+	1-	0o	13o	3o	3-	2+	3-	3o	2-	2+	1+	19o	5-	4+	4+	5+	5-	5o	3o	5+	37-
5	0o	0+	1o	2-	1-	2+	2-	1o	9-	2+	2+	3-	3-	3o	3o	4o	4+	24+	5-	5+	4-	3+	5+	4o	4+	5o	36-
6	4-	5o	5o	3o	2-	2o	3-	1+	24+	5-	4o	4+	4o	3+	3+	3+	3o	30o	4-	3+	4-	4-	2+	4-	4-	1+	25+
7	2-	2o	2+	2o	1o	4+	4-	2+	19+	4+	5+	4+	4-	4o	4o	4-	4-	33o	3o	2+	2o	3-	1+	3-	4+	4+	23-
8	3-	2+	2+	2-	1+	1o	2-	3+	16+	4o	4-	3+	3+	3o	3+	3+	3o	27o	4o	3+	1o	2+	3-	2+	3o	4-	22+
9	2+	3o	3+	3+	4-	3+	3o	2-	24-	3o	4o	4o	2-	2-	2+	4o	3o	24-	4o	3-	3o	2-	1o	2o	3+	4-	21+
10	3+	2o	2o	1+	3-	2+	2+	3-	19-	3+	2+	3o	3-	2o	2-	2o	3-	20-	3+	4-	2o	1+	1o	1+	2o	1+	16o
11	3o	2+	1+	3-	3o	2-	3o	3-	20-	2o	1+	2o	1o	1+	2-	3-	1+	13+	3o	2+	1+	1+	2o	1+	4-	5o	20o
12	2+	2+	2o	1o	2+	2-	2-	2o	15+	1+	1o	1+	2o	2-	1o	1+	2-	11+	2-	1+	0+	2o	4-	3o	2+	4-	18o
13	3+	1+	2-	1+	0+	1-	2o	2+	13o	4-	2+	4-	4o	5o	4+	4o	4+	31+	3o	3o	2o	2-	1-	3o	4-	4o	21o
14	1+	1-	1o	1-	0+	0+	1-	2+	7+	5-	4o	4+	5o	3o	4-	2+	3-	30-	6+	6o	6+	7o	6-	4+	5+	6o	47o
15	2o	2o	3-	2-	1+	1o	1-	0+	12-	4+	5+	4-	4+	4o	4-	4-	2+	31+	3-	4-	5-	5-	3o	3o	4-	4-	29o
16	1+	1o	2-	2+	3-	4-	2-	2o	16+	4-	4o	1o	1+	1+	2-	3-	4+	20o	3+	3-	1+	1+	2-	1o	1+	0o	13-
17	6-	3o	4+	4-	5o	6-	4+	5+	37o	3o	4-	4o	5-	3+	3-	3+	3-	27+	1o	2+	2o	1o	2o	1o	1+	2-	12+
18	4o	4+	4o	4o	3-	4+	5+	5-	33+	2o	2o	2-	3-	2+	1+	3-	1o	16-	3o	1-	1o	1-	0+	1+	4-	12o
19	4+	4-	4-	3+	4o	4o	3-	4o	30-	1-	0+	1-	2-	2-	4-	2o	1o	12-	2-	2-	2o	4+	5+	4+	4o	4-	27o
20	4-	3o	3-	3-	2+	1o	2+	4-	21+	1-	1+	2o	3-	3o	2o	4-	4-	19o	5-	4-	4+	4o	4+	5+	4-	4+	34+
21	2+	3+	1-	0+	0+	1-	2o	2-	11+	4o	3+	2o	3o	5o	6-	5-	5+	33o	4o	4o	4o	4o	4o	4o	6o	4-	34-
22	1o	2o	2o	1+	1o	1+	3+	3o	15o	4-	5o	3+	5-	5-	6-	5+	5-	37o	5-	5+	4o	4+	4+	5+	4-	37o
23	3+	2o	3+	3+	4o	4+	4+	4o	29-	4o	4-	4+	3+	5-	5-	6-	5o	35+	2o	3-	3o	3o	3o	5-	3+	5o	27-
24	3+	4-	4+	4o	6-	5o	4o	4o	34o	3+	3+	3+	4o	3+	5o	3+	4-	29+	3-	2o	2-	2+	2-	3o	3o	3o	19+
25	3+	5-	4o	5-	3+	4o	3+	4-	31o	3+	3o	3o	3+	4-	3+	4-	4o	27+	2-	2+	2o	3o	2-	1+	3o	2o	17o
26	5o	3o	4-	4-	4-	3o	3o	4o	29o	3+	4-	3o	4o	3o	3-	3-	0+	23-	2-	2o	2-	1o	0+	0+	1o	1-	9-
27	2+	2+	3o	4-	4o	4o	4-	4-	27-	0+	0+	1-	1o	1-	2+	2-	1o	8o	0o	0o	0+	1o	1-	0+	1o	1+	5-
28	3+	2+	1+	3o	3o	2+	4-	2+	21+	3o	2+	1+	4-	2o	2o	1+	2o	18-	5-	4o	3+	6-	6o	6+	6+	5+	42-
29	2+	1+	1+	2o	1+	2-	1-	3-	13+										5-	4+	4-	3+	4o	5-	6+	6-	37-
30	3o	4-	2o	2o	3-	3-	3+	3-	22o										5o	5o	5+	4o	5-	7o	7+	8-	46o
31	2-	1o	3-	1o	1o	0+	1-	0+	9-										8-	7-	6-	7o	5+	4o	3+	3+	43o

	April 1941									May 1941									June 1941								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	3-	2o	0+	2o	1+	2-	1o	3-	14-	0o	0o	0+	2-	2+	3-	3o	3-	13-	3-	3o	3o	2-	2-	1o	1+	2-	16o
2	3o	2+	2+	2-	3o	2o	2-	3+	19+	2-	2+	2-	1-	2-	2-	1+	2o	13o	2-	1o	0+	0o	0+	1-	0o	0+	4+
3	4-	4+	2-	2-	2o	3o	3o	3-	22o	2o	3-	2o	1o	1o	1-	2+	2-	13+	1o	0o	1o	2-	1o	1-	1-	0o	6o
4	2+	2o	2+	2-	0+	0+	1-	2o	12-	1-	3o	4+	4o	2o	1+	1+	2o	19-	1o	1o	1-	0+	0+	1o	1-	1o	6o
5	1+	2o	2+	1o	1-	2-	1-	2+	12o	2+	1-	2o	2-	2o	2-	1o	0+	12-	1o	1-	1+	1o	1-	1+	1o	1+	8+
6	3-	3+	2-	1o	1+	1+	1+	3o	16-	1-	2-	2+	3+	3-	1+	3-	1-	15+	1-	1o	0+	3+	2+	1o	1+	1-	11-
7	0+	1-	2-	3+	3o	3-	4o	4+	20o	1+	3o	2o	0o	0+	1o	1o	2-	10+	1-	0+	1+	1o	2-	1+	0+	1-	7+
8	4o	2-	1+	2o	2+	2o	2+	3-	18+	0o	0+	0+	2+	2+	2o	3+	2+	13o	0+	0+	2o	2+	1+	2-	0+	0+	9-
9	3+	5-	4-	3o	4-	3+	2-	1+	25-	3-	3+	3+	2+	2-	1o	2-	3-	19-	0+	1-	1+	4-	3-	1+	2-	2+	14o
10	2o	3o	5-	3-	3-	5o	4+	5o	29+	4-	2+	2+	2+	2+	2o	1+	2o	18+	3-	2o	4o	4-	6o	5+	3o	4o	31-
11	4-	4-	5o	4+	3o	3o	3o	3-	28+	3o	1o	1o	1o	2-	1+	0+	0+	1-	9+	6-	3+	3o	3-	2-	3+	4+	2+	26+
12	4-	5o	4-	4-	3+	2+	2-	2-	25o	1o	2o	1o	1-	1o	1o	2+	2+	11+	2+	3o	2-	2-	3-	3o	3-	2-	19-
13	4o	1+	1+	1o	1o	1o	1-	1+	12-	3o	2+	2+	2o	3-	3-	1o	1-	17-	1-	3+	5+	6o	5+	4-	4+	5o	34-
14	1+	2+	2-	1-	0+	0+	0+	0o	7o	1o	1+	1-	2-	2-	2o	1o	3-	12o	5-	4+	4-	1+	3-	1o	2+	4-	24-
15	0o	0+	0+	1+	2o	2o	2-	3o	11-	3o	1+	1+	2-	0+	2-	2o	2o	13+	4-	4+	4+	4+	3+	3-	3+	2o	28o
16	4o	1+	0+	4o	4-	1+	1o	1-	16+	4-	2o	3+	4-	4o	4-	1o	2o	23+	1+	1-	1+	1-	1-	1-	1-	1o	7o
17	1o	2o	2o	2+	2+	3-	1+	2-	15+	1o	5o	5+	4+	4o	2+	2o	3o	27o	1o	1+	2o	3-	3-	3+	5+	4o	22+
18	4o	2-	1+	3-	4-	2-	3-	5o	23-	2-	3o	1+	1o	1o	2+	3-	3o	16o	4+	4o	3-	2-	2o	3o	3-	1-	21o
19	3o	6+	6+	4o	4-	4o	3+	3+	34o	3-	2+	1-	0+	0+	1-	1+	0+	9-	0+	1-	1-	2o	2o	2+	3o	3o	14o
20	3o	2o	3+	2o	3o	2o	3o	3+	22-	1-	1-	0+	1o	1-	1+	0+	2o	7o	3+	4-	5+	3o	3-	3o	3o	4-	28-
21	3+	3-	2+	1+	3-	2-	3o	1-	18-	2o	2-	3-	2+	1+	4o	5-	5o	24-	3+	3-	3+	2o	2+	2o	2+	2-	20-
22	0o	2+	2+	0+	1+	2-	2-	2o	12-	5o	5-	3-	4o	4o	3o	5o	4+	33-	2+	1o	3o	3-	2+	1+	2+	3-	18-
23	0+	0+	0+	1+	2-	1-	1+	1o	7o	3o	3-	3+	4o	4-	2+	4+	5o	28+	2-	1+	1-	1+	1+	1+	1o	2o	11-
24	1-	1+	5o	7-	6+	6+	6+	5+	38o	3+	4o	4o	3o	3-	2+	4o	3o	26+	1o	0+	1o	2+	2+	2+	2+	3o	15-
25	6-	6o	5+	5-	3-	5-	4-	3+	36o	4+	3o	3-	3-	2+	2+	3o	4o	24+	2-	1o	0+	0+	1+	0+	2-	3-	9+
26	3+	4o	3-	5+	2o	2-	1+	3-	23o	3o	2-	2+	3-	2+	2-	3-	3+	20-	3+	1+	1+	1o	1o	1o	3-	3+	15o
27	2o	1-	2-	1o	0+	1+	1o	1o	9o	2o	2-	2-	1+	1+	2-	2+	2o	14o	2+	3+	3+	2+	2+	1o	2-	1o	17+
28	2+	3+	2-	2+	2+	4-	4+	4+	24+	2-	2o	3o	2o	2o	2-	1+	3+	17o	3-	1+	1+	2o	2o	2-	2o	2o	15o
29	5+	4-	3+	2-	1-	0o	0o	1o	16-	3-	3+	3+	2-	2-	1+	1+	2o	17+	3o	2o	2+	2o	2-	1+	1+	1o	15-
30	1+	2o	1-	0+	0o	1-	0+	0+	6-	3o	1+	1-	1o	2o	2+	3-	1+	14+	1o	1o	2-	2-	2-	1-	1+	2+	11-
31										4o	3-	2-	1+	2o	2+	3+	2-	19o									

Table 52.-- Geomagnetic planetary three-hour-range indices Kp (continued)

	July 1941									August 1941									September 1941								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	3+	3+	2+	2-	1o	1-	1-	2o	15o	1o	1-	2+	2o	2-	1+	3o	3o	15o	3-	3o	3+	3+	2+	4o	3+	3o	25o
2	3o	3-	3o	1o	1+	1-	1-	1-	13o	5-	4+	5-	5o	5+	5o	3+	3o	35+	3o	2-	4o	3o	2o	3-	3o	3o	22+
3	2o	1+	0+	1o	3-	4-	2-	2+	15o	2+	4-	3o	2o	2-	3o	2-	3o	20+	3o	1+	1+	1o	0+	1-	1o	1o	10-
4	1o	5-	4o	3o	2+	3o	5+	5-	28o	5o	7o	6o	6-	8+	7-	6+	7-	52-	1o	1o	1o	0o	0+	0+	1-	1o	1+	7-
5	6+	6+	9-	9-	9o	9-	7-	8-	62o	6o	4o	3-	2+	2+	3o	4-	3+	27+	0+	1o	1-	1o	0+	0+	0+	0+	4+
6	3-	2o	3+	4+	6+	6-	6-	5-	35-	2+	3-	4-	3+	3-	4o	3+	6-	28-	0+	0+	0+	1-	1-	1o	1+	1-	5+
7	7o	7-	6-	4-	2+	4+	5-	3+	38-	5-	3+	3o	3o	2-	3-	2+	3o	24-	0+	3+	3o	3o	5o	3o	4o	3+	25o
8	1+	2+	4o	3o	4-	3o	3+	1o	22-	2o	2-	2-	1+	1-	1-	2-	1o	11-	3-	2+	3-	2o	1+	1o	2+	2+	17-
9	1-	1o	1-	2+	3o	3-	4o	4+	19-	0+	1-	1o	1-	1o	0+	0+	1o	5+	3o	2o	2o	2-	1o	1o	2-	4o	16+
10	4-	3o	3o	2-	2+	3o	5-	5o	26+	1+	0+	0o	0+	0o	0o	0+	2o	4+	3o	2o	2-	0+	0+	1o	2-	1o	11o
11	3-	2+	3o	2+	1+	0+	1o	0+	13+	3-	1+	2+	2o	2-	2-	3-	2o	16+	2o	2+	1+	2-	3o	1+	1o	2+	15o
12	1+	1-	3+	2+	4-	1-	1+	1+	15-	2o	2-	1+	1+	2o	1+	1o	2+	13o	2o	2o	1o	1o	1+	1-	0+	0o	7+
13	1+	0+	1o	2o	1o	1-	1-	1-	8-	2o	2o	2o	2o	2+	2-	2-	1+	15o	0o	0o	2-	2+	6-	5+	4-	4+	23o
14	0+	1o	1+	0+	0+	0+	1o	3-	7+	2-	3o	2o	1-	1o	1o	1o	1-	11o	5-	4o	5-	3-	3o	3o	3o	4+	29+
15	1-	1-	1+	2-	2+	1o	1o	1+	10o	2+	1-	1-	1o	1o	0+	0+	0o	6+	4o	4o	3o	3+	3-	3+	3o	5+	5-	30+
16	2-	3o	2o	3-	3o	3o	3-	2+	20+	0+	0o	0+	1+	2-	0+	1o	0+	5+	6-	4o	2o	2+	2+	2-	3+	3+	25-
17	3+	2+	3-	1+	1+	2o	2-	2-	16+	2-	1+	0o	0+	0+	0o	1o	1o	6-	3-	2o	3o	1+	3-	3o	2+	1o	18o
18	3-	1o	1+	1+	2-	1+	2o	1+	13-	1-	0o	1-	1o	1o	2-	2+	2+	10-	2o	7-	8+	9-	9-	9-	9-	9-	60+
19	3-	2+	1-	1-	1o	1+	2-	2+	13-	4-	3+	3+	4o	3+	3o	2+	3-	26-	9-	9o	9-	7+	4o	5o	7+	4o	54o
20	1+	2o	3-	2o	2o	2o	3o	3-	18-	2-	1-	2-	0+	0+	1-	0+	1+	7o	5+	4+	4o	6+	5+	3o	2o	1+	32-
21	3+	5o	6o	6o	3o	3o	5-	3-	34-	2o	2-	2-	2-	1+	3-	3+	2-	16o	3-	6o	4+	4+	4+	5o	1o	1-	28+
22	4o	4o	3-	3-	3+	4o	1+	3+	25+	1+	0+	0o	1o	1-	0+	2o	1+	7o	1o	2-	2+	1o	1-	1-	1-	1o	9o
23	3+	3o	4-	4-	3-	2-	2-	3+	23o	1-	0+	1o	0o	0+	1-	1-	2-	6-	1-	1-	3-	2o	4-	5-	3o	2o	19+
24	3-	3o	2-	2o	2+	2o	3-	2-	18o	1+	2+	3-	3o	2-	2-	2o	2o	17-	4-	4-	3+	3o	4-	3o	4+	6-	30+
25	2+	3o	3+	2+	2+	1+	1+	1o	17o	1+	1o	1+	2-	1o	2+	4-	3o	15+	5+	3o	4o	3-	4-	2+	4o	2-	27-
26	0+	1-	1o	0+	1o	1-	1-	1+	6o	4o	2o	2o	3-	4o	4-	4-	5-	27o	1+	1o	1-	1+	1-	0+	1o	1+	8-
27	0+	1-	1-	0+	1-	0+	0+	2-	5o	6-	5o	6-	6o	6o	4+	5-	5+	43-	3-	3o	3+	2+	2o	3+	2o	2-	20+
28	1o	1-	1-	1+	1+	0+	1o	1-	7o	4+	4-	5-	5o	4-	2+	2+	2+	28+	2o	2+	1+	1o	1o	2-	3-	3+	15+
29	1o	1o	1-	1-	1o	1-	0+	2-	7o	3-	4o	4-	5+	4+	5-	4o	5-	33+	2o	5-	3-	4-	3-	3+	3-	3+	25o
30	1o	1o	2-	1+	1-	0+	1-	2o	9-	5+	5o	4-	3-	4o	2+	3+	2+	29-	4-	2o	2+	3+	2o	2o	3+	2o	21-
31	2-	1-	1-	1-	1o	1o	2o	3+	11o	2+	3-	3-	2o	3-	2+	3-	3o	20+									

	October 1941									November 1941									Deoember 1941								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	2-	2o	2-	1+	1o	1o	1o	1-	10+	8-	7+	7o	5-	5+	5+	3-	1o	41o	3o	3o	6-	7-	8-	7o	5o	6+	44+
2	1-	1o	1-	0+	1-	1-	3o	3-	10-	1o	0+	0+	1-	0+	1+	2o	2+	8+	5-	6o	5-	3+	3o	3+	2+	1o	28+
3	2+	1+	1+	1o	0+	1-	1-	1-	8+	2+	2o	1-	1-	1o	2o	0o	2+	11+	1o	2o	0o	1+	1-	3-	4-	4-	15-
4	1o	0+	0+	1o	1-	1-	1-	2+	7o	2+	3-	2-	1+	1-	0+	1-	2-	11+	4-	3o	2+	4-	3o	2o	4-	3o	24+
5	2+	2o	3-	2+	1+	1o	1-	1-	13o	1o	1+	1+	1+	1+	4-	4+	5-	19o	1-	2-	2o	1+	2-	3-	4-	3+	17o
6	1+	1-	1+	1+	2-	2-	1o	1+	10+	3+	4o	5o	5+	5+	5o	5o	5-	38-	3o	3+	2+	2o	2o	2+	1o	2-	18-
7	2-	1+	1-	0+	0+	1o	1-	1o	7o	4o	3-	3o	3o	3o	3+	3o	3-	25-	2o	3-	2+	2+	1+	1o	2-	2-	15o
8	3+	3+	2-	1-	1-	3o	2+	2-	17-	4-	4o	4o	3o	4-	3+	4-	1+	27-	1+	2-	1+	1o	2o	2-	2o	3o	14o
9	1-	3-	1o	1-	3-	1o	2-	2-	12o	2o	2+	2o	3+	4-	4o	2o	2-	21o	1o	1-	2-	2+	3-	2-	1+	3-	14o
10	0+	1-	1o	1-	1+	2o	3+	2+	12-	3-	3-	2-	3+	5-	5-	4-	4o	27+	2o	2o	2-	1o	2o	2o	0+	1-	12-
11	3o	3o	4o	4+	4+	5-	6-	7-	36-	5-	4+	3-	4+	2o	4-	3o	2+	27o	0+	1o	0+	1o	1o	0+	0+	0o	4+
12	6o	5-	4o	3-	2o	3o	1+	2+	26o	1+	3-	3+	1o	1o	2-	3-	3o	17-	0+	1+	0+	1o	2-	2-	1o	1-	8o
13	3-	3o	3o	2+	1o	2o	2+	1+	18-	1+	2-	2-	2+	1+	2o	2-	2o	14o	1+	1o	2o	2-	3-	3o	3o	2o	17-
14	1+	2+	1o	3-	4-	4o	1+	2o	18+	1o	2-	1+	2-	1-	1+	1+	2-	11-	4+	4+	3-	4o	4-	3+	4o	4+	31-
15	3o	3+	4-	3o	2+	3-	3+	3-	24o	1-	0o	0+	1-	1-	1-	1o	1o	5o	2+	3-	3-	1+	2+	2-	1o	3o	17o
16	2o	4o	3-	1o	3-	3o	3+	4-	22+	1o	2-	1o	1-	0+	1o	2-	3-	10o	3+	5o	3-	2-	1o	1+	1o	1+	17+
17	1-	0+	2+	2o	1+	1+	1-	1o	10-	4-	4o	5-	4o	4+	5o	5-	5-	35o	2-	2o	2+	3-	1o	3-	3-	4-	19-
18	0+	1+	2o	2-	1o	1o	1+	1o	10-	2+	3-	5-	4-	3+	4-	4o	3o	27+	2o	3o	4o	3+	3-	2+	2-	2o	21o
19	3o	2+	3o	2-	2+	4-	2-	1+	19o	6-	3o	3-	3-	3o	2o	2-	3o	24-	2-	1+	2-	1+	1+	1+	1+	1+	11+
20	1o	2o	3o	1+	1-	1o	2-	1+	12o	3o	2-	3-	2o	1o	1-	2o	2o	15o	2o	0+	1-	1o	1o	2-	1o	1-	8+
21	2+	2+	1+	0+	0o	0+	0+	1o	8o	3+	3o	2o	2-	2+	1+	2o	3-	18+	0+	1-	1-	1-	0+	0+	1-	2-	5+
22	2o	2o	2-	2o	3+	6-	6+	5+	28+	3-	1o	3-	2-	2o	3+	4o	4+	21-	1o	1-	1-	1-	1-	2-	1+	1o	8-
23	2o	3+	2+	2-	2+	3-	3+	4o	22-	4-	5-	3o	3-	2+	2+	1+	2+	22+	1+	2o	1-	1o	2+	3o	2o	3o	15+
24	4-	2+	2+	2o	2-	3o	4+	3o	22+	2o	2-	1o	2-	0+	0+	2o	2o	11o	2o	2-	1-	2+	3-	2-	2+	1+	15-
25	2+	3+	1o	1-	1-	1-	1o	1-	10+	1-	1o	2+	1-	1o	1o	2+	1+	10+	0+	1o	2o	1+	1o	1-	0+	1-	7+
26	1-	1+	2-	3o	2o	1o	3o	3+	16o	0+	2-	1+	1-	2-	0+	1-	0+	7o	1-	3-	2-	1+	2-	2-	1o	3+	14o
27	3-	2-	2o	2o	1+	0+	1-	2-	12+	0+	3+	3+	2+	3-	2o	1o	1+	16+	4o	3+	2-	2-	2o	2o	2-	3+	20-
28	1-	1o	1+	2-	1+	2o	3-	2o	13-	4+	6o	6+	6-	3-	4-	6+	4-	39-	3o	3o	2-	1+	1+	1o	1+	3-	15+
29	3o	1o	1-	1o	1o	1o	2o	2-	11+	2o	3-	3o	2o	2o	1-	1+	1o	15-	4-	2o	2+	2o	1+	3-	2-	3-	18+
30	2-	3o	2-	1+	2o	2-	1+	2-	14+	1+	1-	1-	1+	1+	2+	2+	2o	12o	2-	1o	1-	1-	2-	3-	2+	3-	13+
31	3o	6-	4+	3-	3o	4+	6+	7-	36o										2+	1-	0+	0+	0+	3-	2o	1+	10o

Table 52.-- Geomagnetic planetary three-hour-range indices Kp (continued)

	January 1942									February 1942									March 1942								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	0+	1-	1o	1o	0+	1-	1o	1o	6o	0+	1-	1-	1-	2+	1+	1+	1+	9-	3+	3-	8o	8o	7+	6-	7-	7-	48+
2	1o	2o	3-	2o	3+	3+	4-	3-	21-	2+	3-	4o	4-	4o	3+	1+	1+	23-	7+	6o	3+	3+	5-	4o	3+	1+	33+
3	4-	4o	3+	3-	3o	3+	2o	3-	25-	3-	3o	3-	1o	1-	1o	1+	1-	13o	4-	4+	5o	6-	5o	6o	3+	3+	36+
4	2+	5o	3-	2+	4+	4-	4-	5-	29-	0o	0+	2-	1o	1+	1o	1+	2-	8+	3+	3+	3+	4-	2o	4o	3+	2+	25+
5	3-	4+	4-	4+	3-	3+	4-	3o	28-	1o	4o	3o	4÷	4-	3+	5o	2+	27-	2-	5-	5-	3o	3+	7-	7o	5+	36+
6	2-	3-	2+	3o	2o	3o	4-	3o	21+	4+	5-	3o	5o	4o	5-	4+	4+	34+	4+	5+	4+	4o	3+	3-	1-	2+	27o
7	3-	4o	2-	3+	3+	2-	2-	1-	19o	4o	3o	2-	3o	2-	1o	0+	1o	16-	3-	2+	3+	4+	3o	3o	4o	4-	26+
8	1+	0+	1-	0+	1-	1o	0+	3-	7+	1-	1+	1o	1+	1-	1o	0+	2-	8o	6+	6-	4-	3o	3o	4-	5+	4-	34+
9	1+	2-	1-	0+	0+	1+	2o	2o	10-	1+	1-	1+	2-	2-	1o	0+	1-	9-	6+	6+	4-	3o	3+	4o	3+	5-	35-
10	3-	3-	2o	2-	3-	3o	2o	2+	19o	0+	1-	2-	1+	3o	3+	3-	2+	15+	3-	3+	2-	3+	3-	4o	4-	1o	22+
11	3-	1+	2+	2o	3o	2-	2o	2-	17-	2+	1+	2+	1o	2o	2+	3-	3o	17o	4-	5-	2+	2-	0+	0+	1-	1+	15o
12	2o	2-	2+	2+	2-	2o	3+	2+	18-	2-	2-	1-	1o	0+	0o	1o	0+	7-	2o	2-	1+	1+	1-	1-	1-	2o	10+
13	1o	1-	1+	1o	2+	2o	2o	1-	11o	3o	3-	1o	1-	1+	1o	1o	1-	11+	4+	4+	3-	5-	5+	3+	3-	4+	32-
14	1-	1-	1-	1-	0+	1-	1o	3-	7+	0o	0+	1-	2+	2o	2+	1+	3o	12o	3o	3o	5+	5o	4o	4o	2+	4-	30+
15	1o	1-	3-	2o	3-	3-	1o	2-	14+	3+	3+	4-	3-	3+	2o	3+	2o	24-	3o	2-	1+	3o	4o	3-	3-	1+	20-
16	2-	1+	2-	2o	3-	3-	3o	2+	17+	3o	2+	3-	3-	3o	2o	2-	3+	21-	2-	1-	2-	1o	1-	1o	2o	1-	9+
17	4-	3o	5-	5-	2+	2-	1+	1+	23-	3o	3+	2+	2+	1o	1-	1+	1o	15o	3o	3o	3o	2o	1-	1o	2o	2-	16+
18	4+	4-	3+	3o	2+	2o	3o	4+	26o	2+	2o	1+	1-	0+	1-	0+	0+	8o	0+	0o	2+	3+	3o	4+	3o	4-	20o
19	4-	5+	3o	3-	1+	2-	1o	2o	21-	0o	0+	0+	0+	2-	1-	2-	1+	6+	2+	3o	3-	3o	3o	4+	4o	4+	27-
20	3o	1o	1o	2-	1-	1o	1-	1+	10+	1-	3-	2-	2+	2o	2+	2+	2o	16o	5+	4+	3+	2+	1o	2-	2-	0+	20o
21	0o	0+	1o	1+	1o	1-	1+	1o	7-	3-	4-	3o	1+	3o	1o	1o	1o	17-	3o	3+	5-	4+	3o	4+	4-	3o	29+
22	0+	3-	2-	1+	3+	2+	2+	2+	16+	3-	2+	2o	2-	1+	2-	2+	2o	16o	4+	4-	4-	3+	2+	2o	3-	3-	25-
23	2o	3-	2-	1+	2-	2o	1-	1-	13-	4o	3o	2o	1o	5+	5+	6o	6-	32+	3o	3-	1o	2-	3-	3o	3+	3+	21-
24	1-	0o	1o	2-	2-	0+	1-	2-	8-	6-	4o	5o	4+	3-	2+	2-	3+	29o	2-	3o	2o	3o	3-	2o	0+	1-	15+
25	1-	0+	0+	2+	2-	1o	2o	2-	10o	3+	2+	1+	2o	2+	3-	4o	5-	23-	1+	2-	1+	2+	3-	2-	0+	0+	12-
26	1+	2o	1o	2-	1+	0+	0+	1-	9-	3-	2o	2-	1o	1o	0+	1+	2-	12-	0+	1-	3+	5o	5+	5+	3-	2-	24+
27	0+	0+	1+	2+	1-	2-	1+	1+	9+	1o	2-	1-	1o	1o	3o	3+	3o	15-	2o	4-	1o	1+	1o	1o	2+	2o	14+
28	3o	4-	3o	2+	2+	1+	2-	1+	19-	3o	3o	2+	3+	6o	6-	3-	3-	29-	1+	1+	1+	1-	1o	1o	1o	0+	8o
29	1-	1o	0+	1-	1o	1o	2-	2-	8o										1+	3+	2+	3-	5-	4-	2-	2-	21+
30	2-	2-	1+	1+	1+	2o	2-	1o	12o										1+	2o	2+	2-	3+	4o	3o	2o	20-
31	1-	1-	1o	1o	1-	0+	0+	0+	5o										1-	2+	2o	3-	2o	1+	2+	3+	17-

	April 1942									May 1942									June 1942								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	3-	3+	2+	2o	3o	2o	2-	1-	18-	3-	4-	4-	3-	2+	2o	1-	1o	19-	1+	1o	1o	1-	1-	1-	2-	0+	7+
2	2-	3-	4-	4+	5o	4o	4o	4+	30-	0+	2+	3-	3o	3-	3o	2o	3-	19-	0o	0+	0+	0+	1-	0+	0+	0+	3-
3	4o	6o	4o	3o	4-	2+	4o	4+	31+	3o	3-	2+	2o	1+	1-	1-	2o	15-	1-	0+	2-	2+	3+	3o	2+	2+	16o
4	3o	4+	6+	7-	5-	6+	7+	3+	42o	1o	1o	2-	1+	2+	4-	5-	4o	20-	2o	0+	1o	1-	0+	1-	1o	2-	8-
5	3+	3+	1o	3o	3+	2+	1-	1+	18+	6-	4-	3o	2+	2-	1+	1o	3-	21+	2+	1+	2o	1+	1+	2+	0+	1o	12o
6	2o	3o	1-	1o	1o	1-	1-	2-	11-	2o	3o	2-	1+	1+	2-	1+	0+	13-	2-	1+	2o	2+	1+	1-	0+	1-	10+
7	1-	1+	1-	1-	1+	1-	0+	1+	7o	0+	1o	2-	2o	1o	1-	1o	1-	8+	1o	1+	1+	1o	1o	0+	0+	0+	7-
8	5-	5-	4+	4-	4-	4+	3o	2o	30+	1o	1o	0+	1-	1-	1o	1+	2-	8-	2+	1o	1-	0+	2o	1o	1-	0+	8+
9	2+	2+	2+	3-	3o	2+	1+	2+	19-	1-	0+	1+	1o	0+	0+	0+	1-	5o	0o	0o	2-	0+	0+	0+	0o	0+	3o
10	0+	1o	0+	1-	1-	1o	1+	3+	9-	2-	2-	1o	0+	2-	1+	2o	3+	13o	0o	1-	0+	0+	0+	1o	0+	1-	4-
11	5+	6-	6-	5-	5+	4+	2+	2o	35+	3o	2-	2-	1o	1o	1o	1-	0+	10+	2-	2o	3o	3+	5-	5-	4+	3o	27-
12	1-	1o	1o	2+	2o	2+	2o	2-	13o	0+	0+	0+	1-	1o	1+	1+	1o	6+	3+	2+	2+	3+	2+	3o	3-	2o	21+
13	3o	2-	3-	3-	5-	4-	4o	5o	27+	1o	1o	1-	0+	0+	1-	0+	1+	6-	3+	3-	2o	3o	2+	4-	4+	4-	25o
14	6+	5-	3o	4o	3o	4-	2-	1o	27+	2o	4+	5o	4-	3o	3-	2-	1-	23o	3o	3o	4-	3-	3+	2o	3-	2o	22+
15	1-	1o	1+	1+	1o	1-	1+	1+	9-	1-	2+	2o	2o	1+	1o	3-	2o	14o	2-	2+	2o	1o	0+	1-	1-	1o	10-
16	2+	4o	4o	3-	3-	2+	4o	4+	26+	1-	1o	1o	2-	1+	1o	3+	1+	11+	2-	1o	1+	1+	2-	2o	4-	1+	14o
17	6+	6o	5+	5+	4o	4+	3-	3o	37o	2o	1+	1o	1+	1-	1+	2-	2-	11o	2-	2o	3-	3o	3o	2+	2o	1o	18-
18	4-	4o	4o	4o	5+	4+	5-	4+	34+	2o	1-	1o	2o	1-	1o	1o	2+	11-	3+	2+	2+	3o	1o	1+	1-	0+	14+
19	4-	3+	3-	4-	3-	2o	3-	2o	23-	1-	1o	2-	1-	0+	1-	1-	1-	6+	2+	1+	1+	3-	4o	5-	3o	3+	23-
20	3o	2o	1o	2-	3+	3o	2-	1o	17-	0+	1-	2-	1+	1+	3+	3-	3+	15-	2o	3o	3o	2+	2+	2o	1+	1+	17+
21	1o	1-	1-	0o	1+	2-	2-	0+	7+	4o	2o	1-	1+	2+	2+	2o	2+	17o	2-	3-	2-	1-	1+	0+	0+	0+	9o
22	2-	1o	0+	0+	1-	1o	0+	0o	5+	1+	2-	4+	2o	1+	2o	4+	3o	20o	0o	1-	1-	1-	1o	1-	0+	1o	5o
23	0+	2+	3o	4o	5+	5+	4+	3+	28o	3o	2-	2-	2-	1+	2+	2-	2+	16-	1-	1-	1+	1+	2o	2o	2o	2o	12o
24	2-	3+	2+	3-	2o	2-	1+	1-	16-	1o	2o	1o	1o	1+	2-	1+	2+	12-	3+	3-	2+	1+	2o	2o	1o	2o	17-
25	0+	0+	1-	0+	1-	0+	1-	1-	4o	3-	1-	1-	1o	2-	1-	1-	0+	8+	2+	2+	2+	1-	1-	1+	2-	2-	13o
26	1-	2-	1+	1-	1-	1-	0+	1-	7-	0+	0+	0+	1o	1o	0+	1-	1-	5-	1o	2-	1o	1+	1o	2-	1+	1+	10+
27	1-	1-	1+	2o	2+	3+	4-	4o	18o	0o	1o	1+	4-	3+	4-	5-	4-	21+	1+	2o	1o	1-	1o	1o	1-	1o	9-
28	6o	3+	2+	2o	2o	1o	1-	3-	20o	2o	5o	4+	3-	2+	2-	2o	3-	23-	1-	1o	3-	2+	3+	3+	2+	3-	18+
29	2-	1+	2-	0+	0+	1-	0+	2+	9-	2o	2o	1o	1+	1+	1o	1+	1o	11+	3+	3o	3-	2-	2+	2+	3+	3-	21+
30	1o	1-	2-	2o	4o	3-	3o	2+	17+	3-	1+	2-	1+	1-	0+	2-	1o	11-	3+	4+	4+	2+	2+	2-	3-	3o	24o
31										1-	1-	1+	1o	0+	1-	0+	1-	6-									

Table 52.-- Geomagnetic planetary three-hour-range indices Kp (concluded)

	July 1942									August 1942									September 1942								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	2+	4-	4o	3+	2o	2o	2+	2-	21+	2o	2+	1o	O+	1o	O+	1o	2o	10o	1+	1o	1-	3-	3+	4-	3-	1+	17-
2	1-	1+	1o	O+	1-	1+	2o	2-	9o	1o	1o	1+	1+	2o	2o	2o	2+	13o	3o	3o	5o	3o	2-	1o	2+	4o	23o
3	1+	1-	1+	1o	2-	O+	O+	O+	7o	3o	2o	2o	2-	1+	2-	1+	2o	15o	2o	2o	2o	3-	1o	1-	1-	O+	11+
4	Oo	O+	O+	1o	O+	Oo	Oo	O+	2+	1o	2-	2-	1o	O+	1-	1+	1-	8+	1+	1+	2o	3-	2+	3-	2+	1o	16-
5	O+	O+	2-	1+	2o	1+	1+	1+	10-	2-	1o	1-	1-	2-	1-	2o	2+	11-	1+	3+	2-	2o	2o	3-	3-	2-	17+
6	2o	1o	2-	1+	2-	2+	1+	3-	14o	1o	1-	1+	2o	3+	4+	3o	3o	19-	3-	3-	4o	4-	5-	4+	3+	5o	30+
7	2-	O+	2-	1-	2+	2-	2o	2+	13-	4-	2+	4+	4-	2o	2-	3+	4-	25-	2o	3o	3o	2+	2o	3+	1+	3-	20-
8	3+	3+	4+	5+	5o	3o	5o	4-	33o	1+	1-	1+	1-	1-	O+	O+	1-	6o	3o	3-	3-	2o	2-	2o	1+	1-	16o
9	4o	2+	1o	1+	2o	3-	3o	3-	19o	O+	1-	1+	2+	2+	1+	2-	1+	11+	O+	2o	2o	3-	1+	1o	1+	1-	11+
10	2+	3-	2-	1o	1+	2o	1+	3+	16-	2+	3-	3+	2+	4-	5o	5+	3+	28o	2+	3+	2+	1+	2+	1o	1o	1+	15o
11	5-	5o	6-	5-	5+	6o	4+	3+	39o	2+	3o	3o	3o	2+	1-	O+	1o	16-	2o	2+	1+	2+	4o	4o	5-	6o	27-
12	2o	3+	3-	5-	3o	3o	4-	2-	24o	3-	2+	3o	3o	2-	1+	2+	2+	19-	5o	6-	7-	6o	4-	5-	5-	4o	40+
13	3o	3-	2+	2-	1+	2+	2o	1+	17-	3-	1o	O+	O+	O+	O+	2-		7o	4-	4-	3o	4o	2+	3+	4o	5o	29o
14	2o	2+	2+	2+	3-	3+	3o	3+	21+	2-	1o	1+	2-	1o	O+	O+	1-	8o	5-	4o	3+	4-	3o	4+	5o	5o	33o
15	2o	3-	4-	4-	4-	5-	5+	5o	31-	O+	O+	1-	1+	1o	2-	4+	4-	13+	4o	5-	4o	4+	4-	4o	4o	2o	31-
16	4-	3-	3o	3+	3-	2+	3o	3+	24o	4+	5o	4-	2+	2+	3+	7-	4+	32o	4-	5-	3+	3o	3-	3+	3-	5o	28+
17	4-	3+	2+	3o	2o	2-	1+	1o	18+	3+	3o	3o	3o	3+	4-	4o	3o	27+	4o	3o	4-	5+	4+	5+	4o	5-	34+
18	2-	1-	2-	2+	1-	1-	1-	1o	9+	3o	3-	4o	4+	4o	3o	4-	3+	28o	4-	4-	3o	3+	3+	4+	5o	4+	31-
19	2-	1-	1-	1+	2o	1+	O+	1+	9+	3+	3o	4o	4+	4o	4-	4+	5-	31+	4-	4o	4o	4+	4o	4o	3o	4-	31-
20	1o	2-	3+	4o	3+	2-	4-	4-	22+	4o	3+	3-	4-	3+	2o	3+	2+	25-	3o	3+	2+	4+	5+	3+	3+	4+	29+
21	5-	3+	3o	2+	2-	2-	2o	3-	21+	2o	3-	2+	2o	3+	2o	2o	2+	19-	5-	5-	5o	5+	5-	5-	4+	3-	36o
22	2+	1+	2-	2o	3-	1o	1+	2-	14o	3+	4-	3-	2+	1o	2-	1o	4o	20-	3o	5-	3+	4-	4-	3+	2o	4o	28-
23	3-	1+	2+	1-	2-	3-	3o	2o	16+	5-	4+	3o	4-	5o	6o	5+	5o	37o	3+	2o	2+	2+	1o	1-	1+	2o	15o
24	2o	3-	2-	1-	1o	2-	3-	2+	15-	3+	4-	2o	2o	3-	4-	5-	4o	26o	3+	1+	2-	1o	2-	1o	1+	2o	13+
25	3+	4-	3+	3+	4+	3+	4o	4+	30-	3-	5o	4+	3-	3-	3-	3-	3o	26-	2o	2o	1-	1-	1+	1o	1o	2-	10+
26	2o	1o	2-	1-	2o	1+	1+	5-	15-	2+	3+	3-	3-	2+	2o	4-	3o	22o	2-	1o	O+	2-	1+	3o	1+	2o	12+
27	4+	4-	4o	4-	4o	4-	4+	4o	32-	3+	3-	3+	3+	3-	2+	1+	O+	19+	1o	2o	2o	1+	2o	2o	2-	3o	15o
28	3o	4o	3o	3-	3-	2+	3o	2+	23o	1-	1+	2o	1+	1-	1-	O+	1-	8-	2o	1+	1o	1o	2+	1+	1o	1+	11+
29	3+	2+	3-	2o	1o	1+	1+	3-	17-	Oo	O+	1o	1o	1+	O+	1+	1+	7-	1+	1o	1o	2o	2-	1o	1o	O+	9+
30	3+	2+	2+	3-	2+	2o	3-	2+	20o	1-	1o	1o	1+	2-	2+	3+	1o	12+	O+	1-	2-	2+	1o	1-	1+	1o	9o
31	3+	2+	2-	2o	2-	1+	1o	2-	15o	2+	2o	2o	2+	4-	2o	1o	1o	16+									

	October 1942									November 1942									December 1942								
E	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8	Sum
1	O+	O+	O+	O+	O+	1-	1-	2-	5-	2+	3-	4-	3+	2+	3o	1+	1+	20o	2o	O+	1-	1o	1o	1+	3o	3-	12o
2	3-	3-	3-	5-	6+	6o	7-	4o	36-	3o	3+	3-	3+	2+	4-	3o	2o	23+	3o	1o	1-	O+	Oo	1o	1o	1o	8o
3	5+	6+	5-	4+	5-	5+	4+	4-	39-	2o	2o	2-	2o	3-	3o	2+	2-	17+	2o	O+	Oo	O+	Oo	1+	1o	3+	8+
4	4-	5-	4+	4-	4+	5+	3o	4o	33o	1o	2+	4o	4+	2+	1o	2+	2+	20-	3+	2+	3-	1+	4-	4-	1+	2-	20o
5	4-	4+	4o	3o	4+	3o	3-	2+	27+	2-	1-	2o	1-	1o	1-	2+	3+	12+	2+	2-	O+	1o	1-	1+	1o	Oo	8+
6	2+	2+	2o	2-	O+	O+	1+	2+	13-	3+	3-	1o	1o	O+	2-	1-	2o	13-	Oo	Oo	Oo	1-	1o	1-	2-	2o	6o
7	4+	3+	3+	2-	3+	3o	1+	2+	23-	2+	3-	3-	2o	3-	2o	1+	2-	17+	2-	2-	1-	2+	3o	3+	3o	3+	19o
8	2+	3-	1-	1o	2-	1+	3+	1+	14+	2o	3-	3o	3+	3+	2+	4-	3o	23+	3-	2-	3-	1o	3o	3+	4o	4o	22+
9	3o	3-	2-	1o	1+	1+	1+	O+	13-	3-	1+	O+	1o	1o	2o	2-	2o	12o	2-	3+	1+	2+	3+	5-	4o	5+	26o
10	O+	1o	2o	2+	2o	2o	2-	2+	14-	2-	1-	2+	2-	4o	3-	2+	3-	18o	5+	5-	4o	3o	2o	2o	3o	3+	27+
11	1o	1-	1-	2-	2o	2o	5-	3o	16-	3+	3-	3-	2+	3o	2-	4-	3o	22+	1+	4o	2+	3-	4o	2o	2+	4o	23-
12	4+	4o	3+	6o	5o	4+	4-	4o	35-	3-	3+	3o	1o	2+	2+	2+	3-	20-	3+	2o	3o	3o	3+	2+	2-	3-	21+
13	4+	4-	3-	3+	4+	6o	4+	4+	33o	3-	2+	2o	2+	4-	3+	3o	3-	22o	2+	Oo	1-	1-	1-	2+	1o	1o	9-
14	4o	3+	3+	3+	5o	5+	5-	5o	34o	3o	3o	3+	3-	2o	3o	4o	3+	24+	2-	2o	2-	2o	2o	3-	2-	2-	15+
15	3-	5-	4+	3-	3+	3+	5-	5-	30+	4+	2+	1-	1-	1+	2+	3-	3+	18-	2-	2o	1-	O+	1+	2-	2+	1+	11+
16	5-	3o	3o	3-	4+	3+	4+	2+	28-	4-	1+	1+	1-	1-	O+	2o	2-	12-	2o	3-	2+	1+	1o	2+	2-	2o	15+
17	3+	4o	3-	2o	2o	3-	3+	3-	23-	1+	2o	2-	2o	2+	2-	2-	2+	15o	Oo	1-	1-	1o	1-	1+	1-	1+	6+
18	2o	3o	3o	3o	3-	5-	4+	3+	26o	3o	2-	3o	3-	2+	3-	3o	2-	20o	1+	1+	1-	O+	O+	1-	O+	Oo	5o
19	5o	4+	4+	4+	4+	5+	4-	2+	34-	1-	2-	2+	2+	1o	1+	2o	2-	13o	1-	1o	1+	1+	O+	Oo	O+	1o	6o
20	4-	3+	2-	3+	5-	5-	2o	1-	24o	2+	3+	2o	4-	2+	3-	4o	3-	23o	3o	2+	1-	1o	Oo	3o	3-	4-	16+
21	1o	1+	1+	1-	2+	4-	1+	1+	13o	2+	2+	3+	3-	2+	1+	2+	2o	19-	4o	5o	4-	5-	5o	4+	4-	4o	34+
22	1+	2-	1-	1o	2-	1-	1o	1-	9-	1o	O+	2-	1o	1-	2o	1+	1+	9+	4+	4+	3+	4o	3-	1+	2+	1o	23o
23	1o	1-	2-	2o	2o	1o	1o	1o	10+	2o	2-	2-	2-	3o	4o	3o	5+	22+	2-	3+	5-	5o	5o	5-	4+	3o	32-
24	1-	1o	Oo	O+	1o	1o	1-	1o	6-	6+	7-	6-	7-	4+	3+	5o	3o	41o	2+	3-	3+	4-	4o	4-	2+	4-	26-
25	2o	4-	4-	3o	3+	2-	1+	1o	20-	4+	5-	4-	4+	4-	4-	4+	5o	34o	4+	2+	2+	2+	3o	3-	2+	3-	22o
26	2+	3o	2o	1o	1-	1-	2o	3-	14+	5-	6-	3o	4o	5-	4+	5o	4o	35+	3o	5-	4o	3o	4-	4o	4-	4o	30o
27	3+	2o	3-	1o	1o	2o	1+	2-	15o	3-	2o	3o	4+	3-	2o	3+	3o	23o	2o	3-	1+	1o	1+	1o	1o	2o	12+
28	1-	1-	1-	3-	5o	7-	7o	7o	30+	3-	3-	3o	4-	4o	5-	4o	5-	29+	1+	2+	1-	1-	2o	1+	1o	1o	10-
29	5+	6-	7+	6o	5+	5+	6+	6o	47+	4+	3-	2+	3+	3+	4-	3o	2+	25o	O+	1o	O+	1o	1+	2-	1o	1o	8-
30	5o	5-	5-	4+	4+	5+	4-	4o	37o	1+	2o	3-	2-	3o	2o	2-	1+	16-	1-	O+	O+	Oo	Oo	Oo	1-	O+	2+
31	4+	4-	4o	5-	5o	4-	4o	4-	33o										1+	O+	O+	O+	Oo	Oo	Oo	O+	3-

Table 53

Preliminary values of mean K-indices, Kw, from 34 observatories:

Preliminary values of International Character-Figures, C:

Geomagnetic planetary three-hour-range indices, Kp:

Final magnetically selected days for December 1949

Gr. Day 1949	Values Kw	Sum	C	Values Kp	Sum	Final Sel. Days
1	2.9 2.8 2.9 2.2 1.2 1.2 1.1 0.6	14.9	0.6	3o 4o 4o 2+ 0+ 1- 1o 0o	15+	Five
2	0.3 1.4 2.0 1.4 0.8 0.4 0.4 1.4	8.1	0.1	0o 2o 3- 2o 0+ 0+ 0+ 1o	9-	Quiet
3	1.6 1.1 1.5 2.0 3.4 2.6 2.3 3.0	17.5	0.7	1+ 1o 2- 2o 4- 3- 2+ 3+	18o	
4	2.8 2.1 2.6 2.5 2.5 2.1 3.7 3.5	21.8	0.9	3o 3- 3o 3- 2+ 2o 4- 4o	23+	7
5	2.7 2.2 1.8 1.9 2.0 2.7 2.7 2.4	18.4	0.7	3o 3- 2+ 2+ 2o 3- 2+ 2+	20-	11
						12
6	2.8 2.0 2.1 2.5 2.3 1.9 2.3 1.6	17.5	0.6	3+ 2+ 3o 3- 3- 2o 2+ 2-	20o	13
7	1.5 2.0 0.7 0.5 0.9 0.8 0.3 0.6	7.3	0.0	2o 3- 1o 1- 1- 1o 0o 0o	8o	18
8	0.3 0.5 1.1 1.2 1.9 1.9 1.7 2.4	11.0	0.2	0o 0o 1+ 1+ 2+ 2- 1+ 2o	10o	
9	1.6 4.0 4.1 3.4 2.8 3.1 2.3 2.9	24.2	1.1	2- 5- 5+ 4+ 3o 3+ 2+ 3-	28o	
10	1.6 1.0 1.5 1.3 1.1 1.3 2.4 1.7	11.9	0.3	1+ 1+ 2o 1+ 1- 1+ 2o 2-	12-	
						Five
11	1.1 0.3 0.7 0.8 0.6 1.4 1.4 0.4	6.7	0.1	1+ 0o 1o 1o 0+ 1o 1+ 0o	6o	Dist.
12	0.4 0.9 0.6 0.8 0.7 1.0 0.9 1.2	6.5	0.0	0o 1- 0+ 1- 0+ 1- 1- 1-	4o	
13	1.3 1.1 1.3 0.7 1.2 1.4 0.4 0.9	8.3	0.0	1o 1+ 2- 2- 1- 1+ 0o 0+	7o	4
14	1.8 2.3 2.5 2.9 3.4 3.7 2.3 2.6	21.5	1.0	2+ 3- 3+ 3o 3+ 4- 2+ 2+	23o	9
15	2.4 2.0 1.5 2.0 1.3 1.3 1.2 2.4	14.1	0.5	3o 3- 2- 2o 1+ 1o 1+ 2+	15-	14
						30
16	3.6 1.9 1.1 1.0 1.0 1.1 2.1 1.4	13.2	0.6	4+ 2+ 1+ 1- 1o 1o 2+ 1+	14+	31
17	1.8 1.8 1.2 1.2 0.6 0.6 1.6 1.9	10.7	0.2	2o 2+ 2- 1o 0+ 0+ 1+ 1+	10+	
18	1.2 1.1 0.6 0.6 0.8 0.7 1.5 1.6	8.1	0.1	2- 1o 1- 1- 1- 1- 1+ 1o	8-	
19	0.6 1.4 1.6 1.1 2.4 1.9 1.1 2.7	12.8	0.4	0+ 1+ 1+ 1- 2+ 2o 1- 2+	11o	
20	2.7 1.6 1.9 2.2 1.0 2.7 2.8 2.4	17.3	0.6	3o 2o 2+ 3- 1o 3- 3- 2+	19-	
						Ten
21	1.0 3.1 2.1 1.7 2.1 2.6 2.5 2.3	17.4	0.8	1o 4o 2+ 2- 2o 2+ 2+ 2o	18-	Quiet
22	2.6 2.7 0.9 1.4 0.9 0.8 2.4 1.9	13.6	0.5	3- 3+ 1o 1+ 1+ 1- 2o 2-	14o	
23	1.2 1.4 0.8 1.2 2.2 2.9 4.0 2.3	16.0	0.8	1o 1+ 0+ 1+ 2o 3o 4o 2o	15o	2
24	3.9 2.6 2.7 2.7 1.4 2.4 2.5 1.0	19.2	0.8	4+ 3o 4- 4- 1+ 2+ 2o 1-	21o	7
25	1.9 1.4 1.5 1.5 2.5 2.5 1.7 2.0	15.0	0.5	2+ 2o 2o 1+ 3- 3- 1+ 1o	15+	8
						11
26	2.3 1.6 1.7 1.4 1.1 1.1 0.8 1.6	11.6	0.2	2+ 2+ 2o 1+ 1o 1o 0+ 1o	11+	12
27	1.8 0.5 0.5 1.1 1.9 2.1 2.2 1.8	11.9	0.3	2o 0+ 0+ 1+ 2+ 2o 2o 2-	12o	13
28	1.8 0.9 1.5 2.4 1.5 1.8 3.5 3.1	16.5	0.7	2o 1- 2o 3- 2- 2o 3o 3-	17-	17
29	2.9 1.6 1.1 1.4 1.6 1.1 1.5 2.4	13.6	0.5	3+ 2+ 1+ 2- 2- 1+ 2- 2+	16-	18
30	1.7 1.4 1.4 1.3 1.4 2.7 4.1 3.7	17.7	0.9	2o 2- 1+ 1+ 1o 3- 4o 4o	18o	26
31	2.1 2.5 2.8 3.6 2.9 2.4 4.3 2.4	23.0	1.2	2+ 2+ 4- 4o 3+ 3- 4o 2+	25-	27
Mean	1.88 1.62 1.66 2.06 1.72 1.67 1.81 2.00	1.80	0.51			

GRAPHS OF IONOSPHERIC DATA

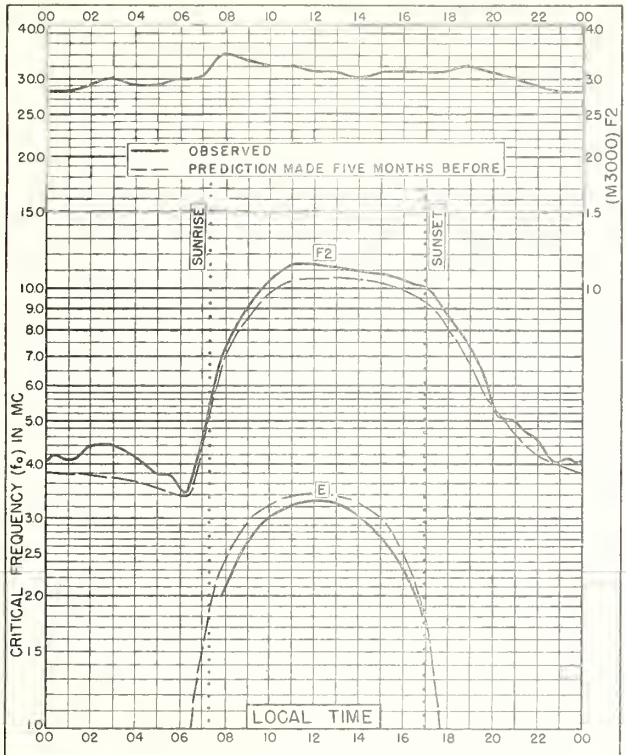

Fig. 1. WASHINGTON, D. C.
38.7°N, 77.1°W JANUARY 1950

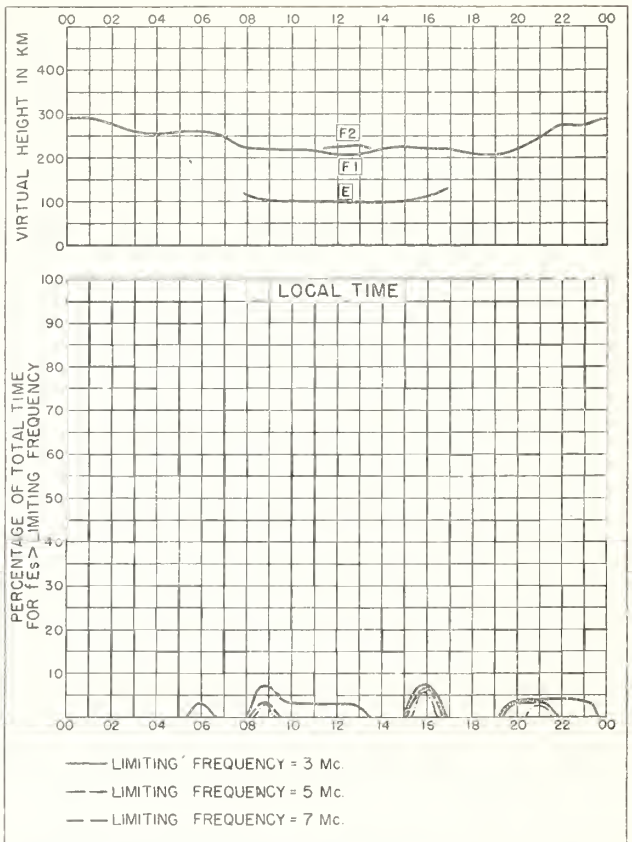

Fig. 2. WASHINGTON, D. C. JANUARY 1950

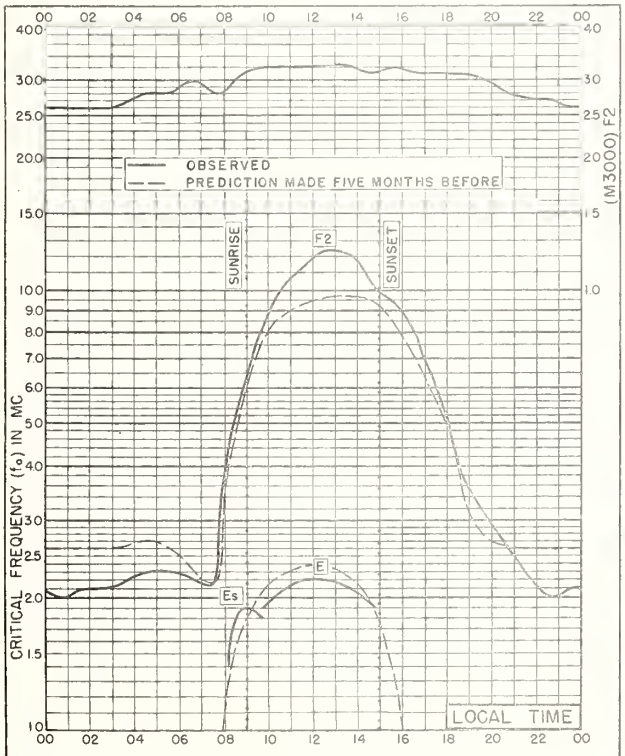

Fig. 3. OSLO, NORWAY
60.0°N, 11.0°E DECEMBER 1949

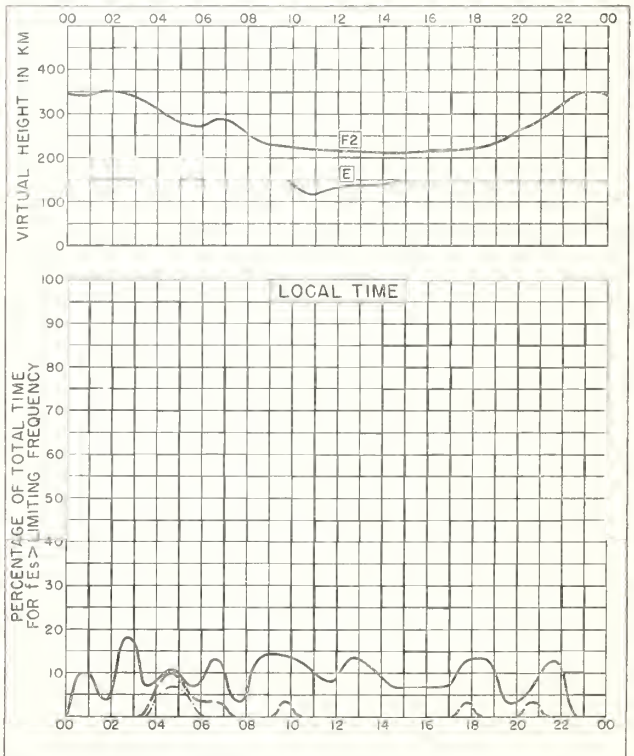

Fig. 4. OSLO, NORWAY DECEMBER 1949

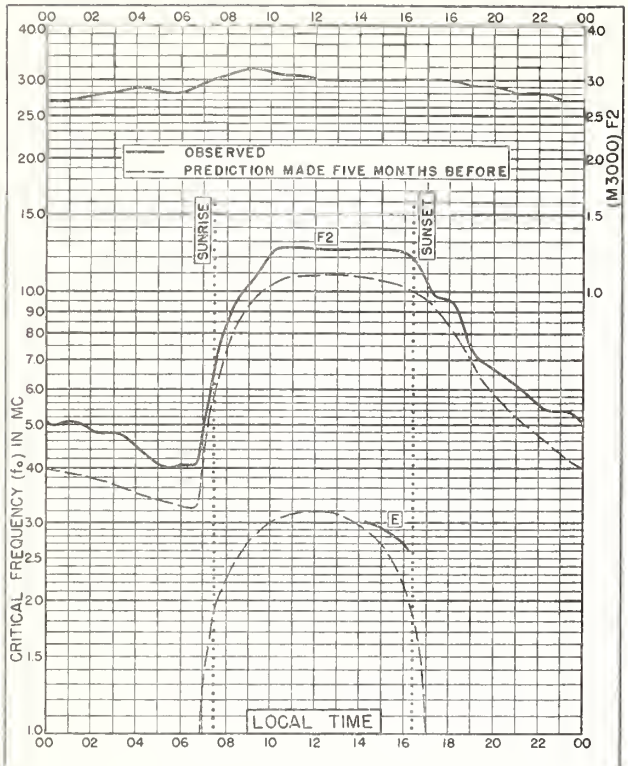

Fig. 5. BOSTON, MASSACHUSETTS
42.4°N, 71.2°W DECEMBER 1949

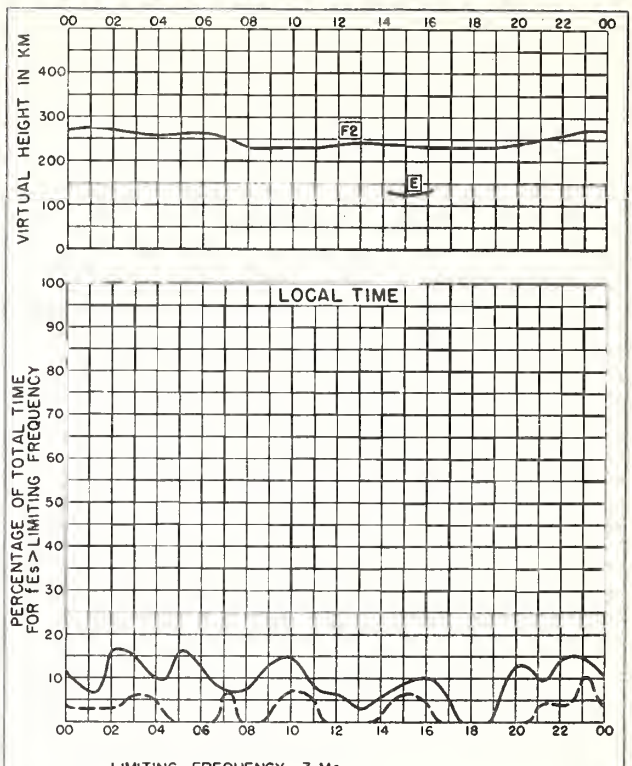

Fig. 6. BOSTON, MASSACHUSETTS DECEMBER 1949

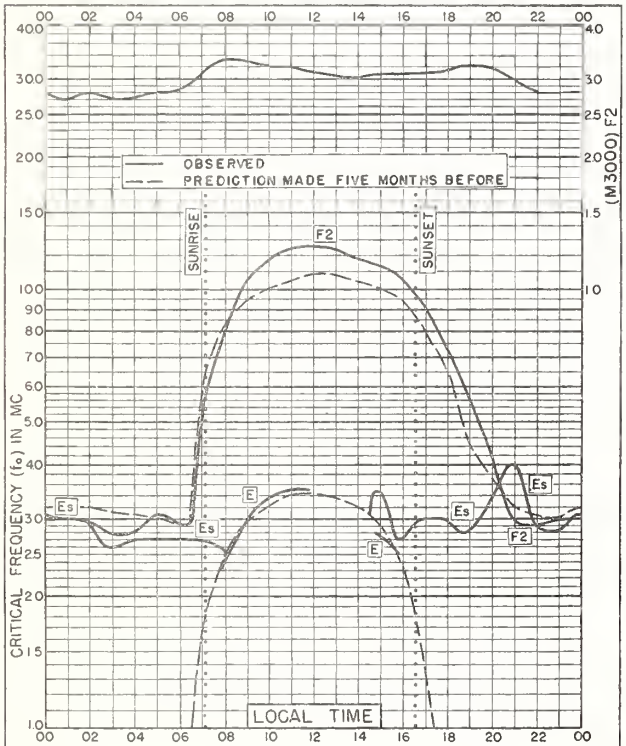

Fig. 7. SAN FRANCISCO, CALIFORNIA
37.4°N 122.2°W DECEMBER 1949

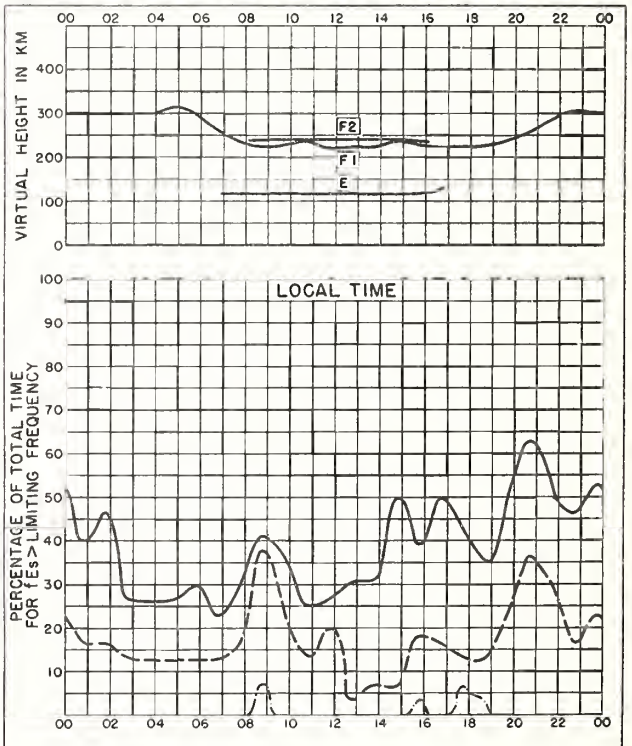

Fig. 8. SAN FRANCISCO, CALIFORNIA DECEMBER 1949

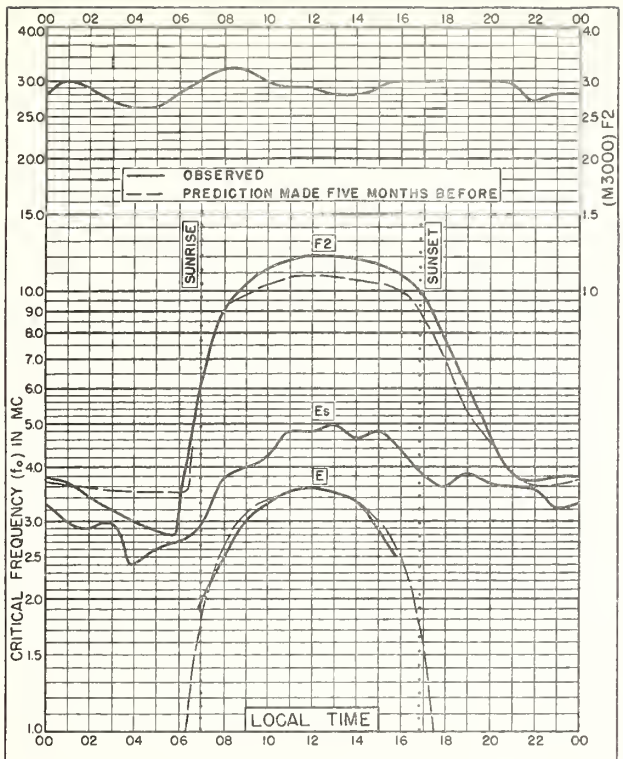

Fig. 9. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W DECEMBER 1949

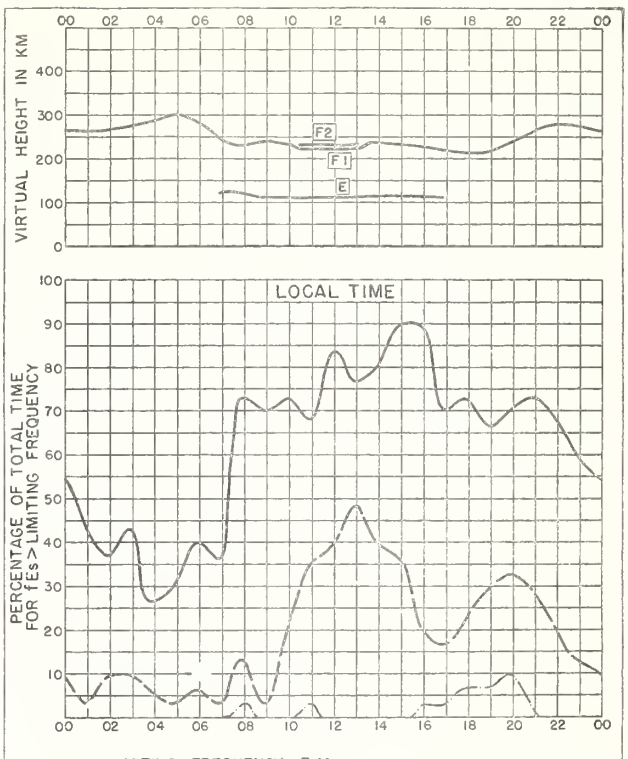

Fig. 10. WHITE SANDS, NEW MEXICO DECEMBER 1949

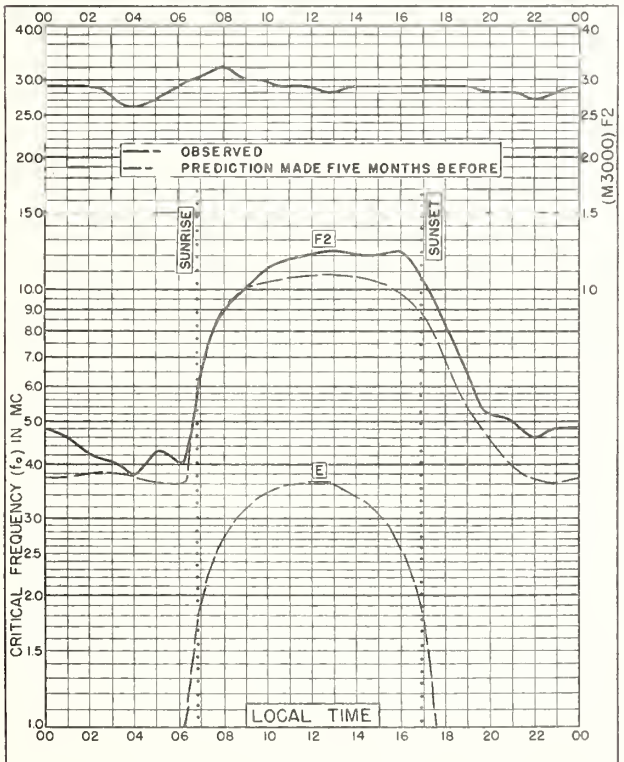

Fig. 11. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W DECEMBER 1949

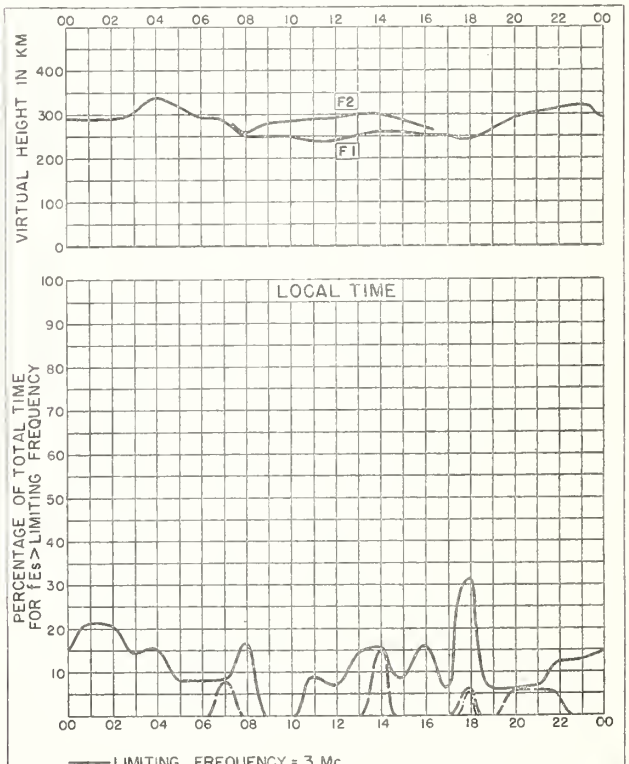

Fig. 12. BATON ROUGE, LOUISIANA DECEMBER 1949

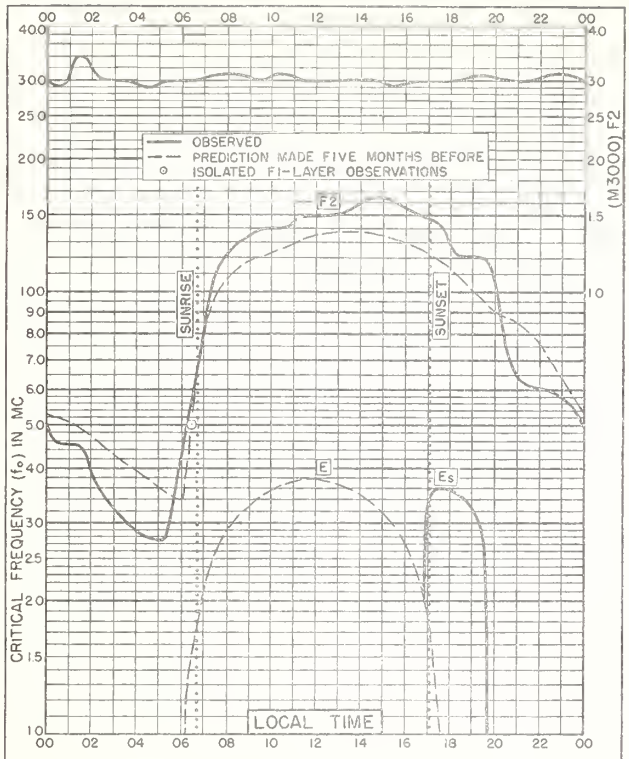

Fig. 13. OKINAWA I.
26.3°N, 127.7°E DECEMBER 1949

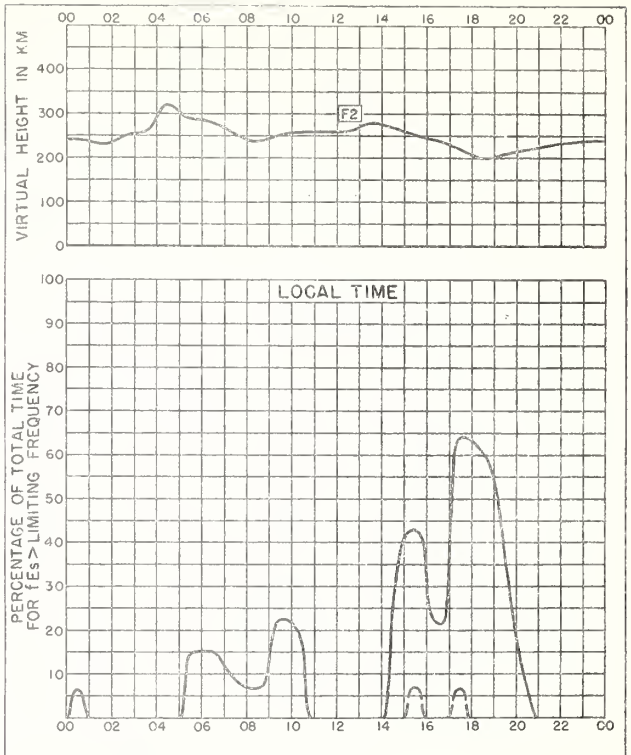

Fig. 14 OKINAWA I. DECEMBER 1949

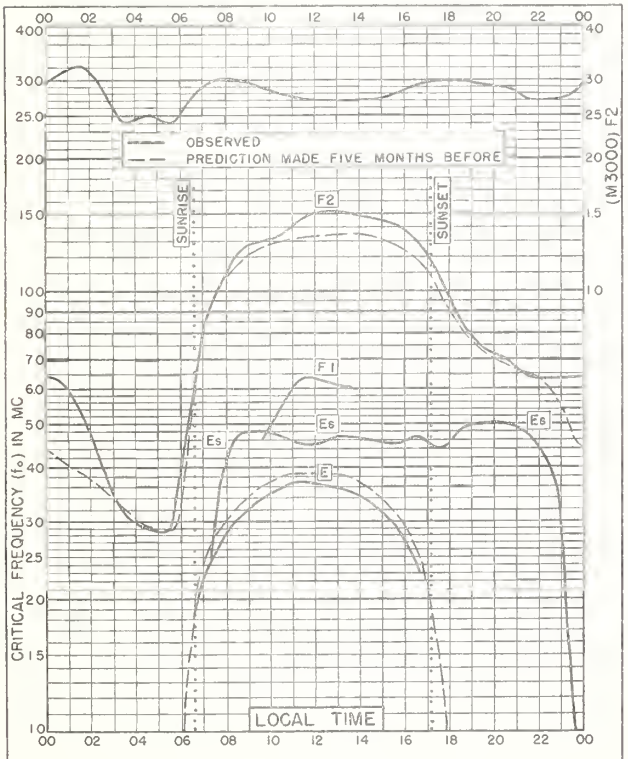

Fig 15. MAUI, HAWAII
20.8°N, 156.5°W DECEMBER 1949

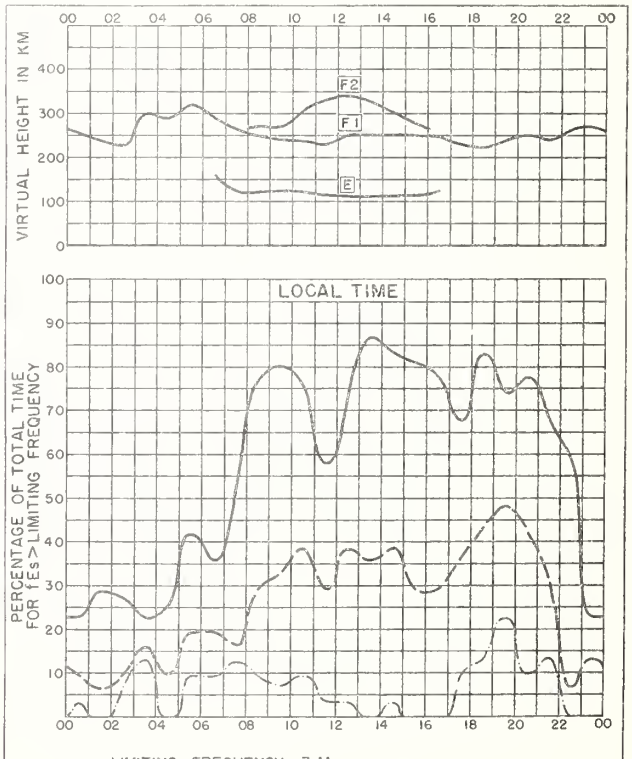

Fig 16. MAUI, HAWAII DECEMBER 1949

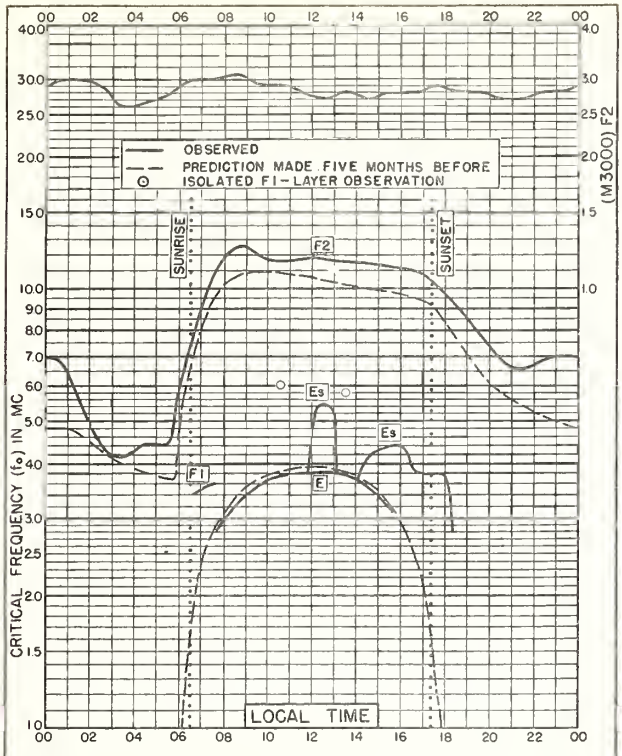

Fig. 17 SAN JUAN, PUERTO RICO
18.4°N, 66.1°W DECEMBER 1949

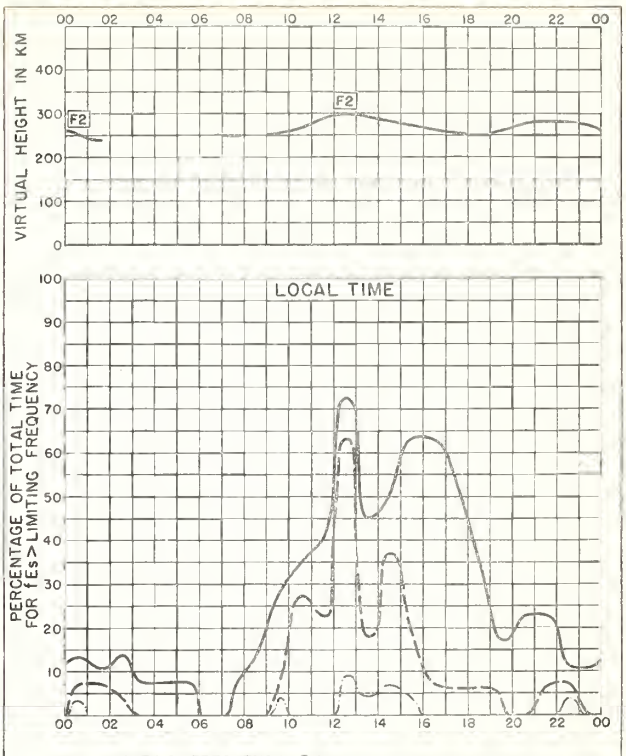

Fig 18 SAN JUAN, PUERTO RICO DECEMBER 1949

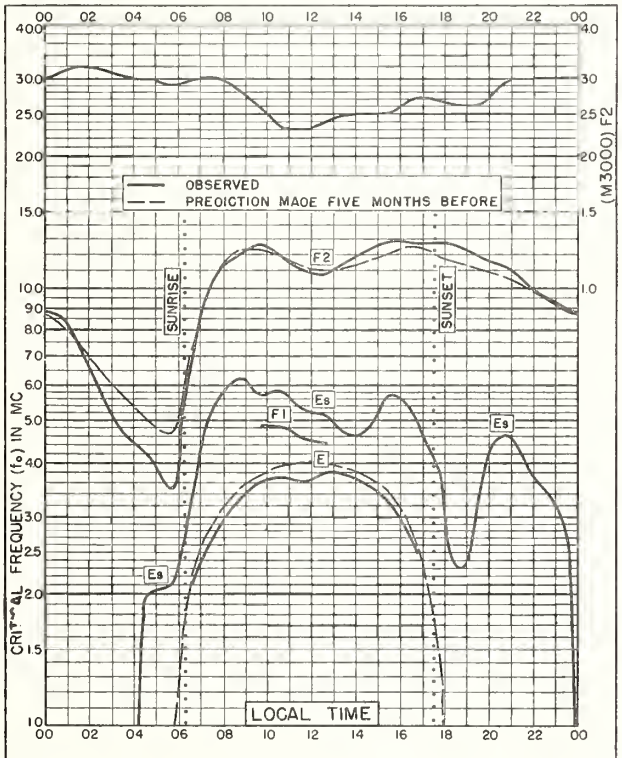

Fig 19 GUAM I.
13.6°N, 144.9°E DECEMBER 1949

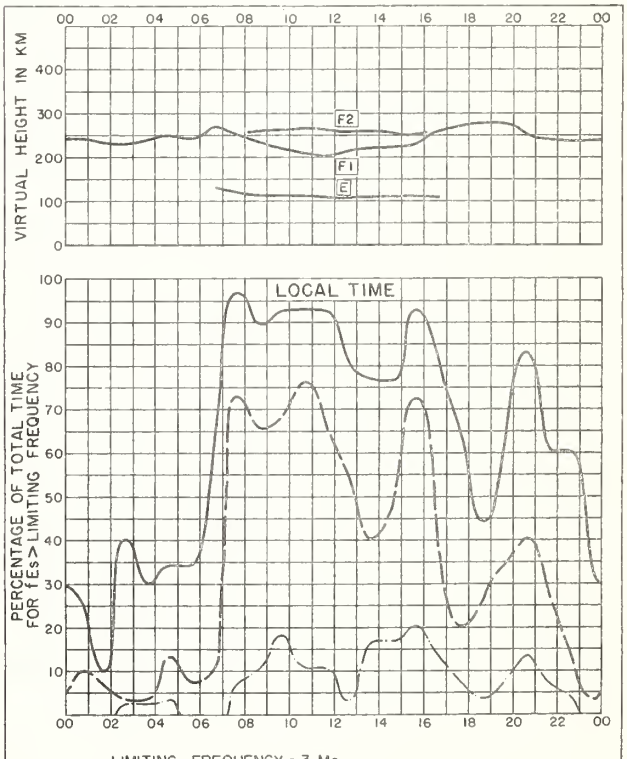

Fig. 20 GUAM I DECEMBER 1949

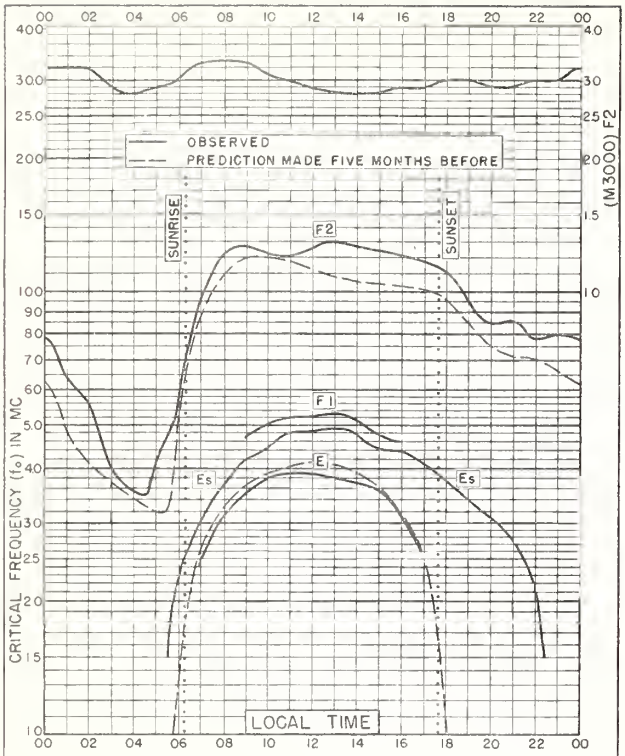

Fig 21. TRINIDAD, BRIT WEST INDIES
10.6°N, 61.2°W DECEMBER 1949

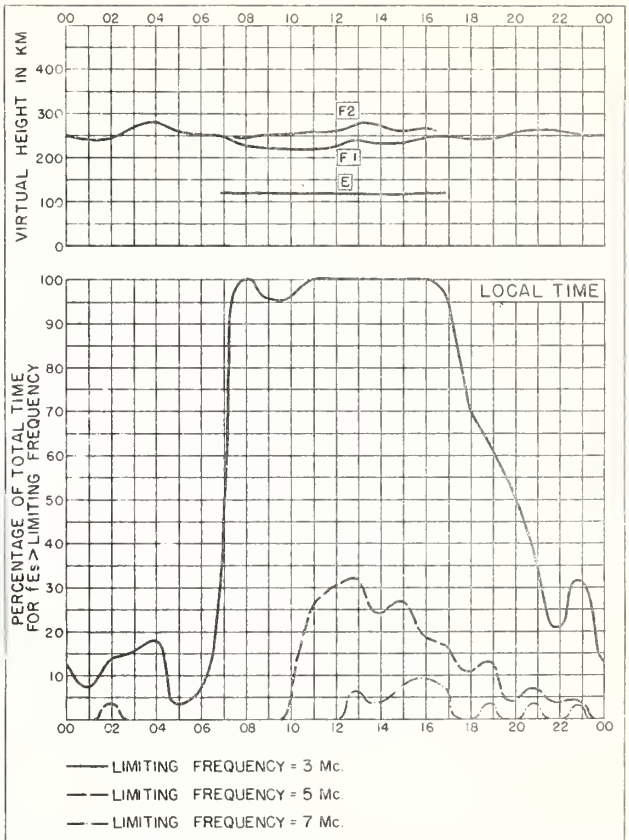

Fig. 22. TRINIDAD, BRIT WEST INDIES DECEMBER 1949

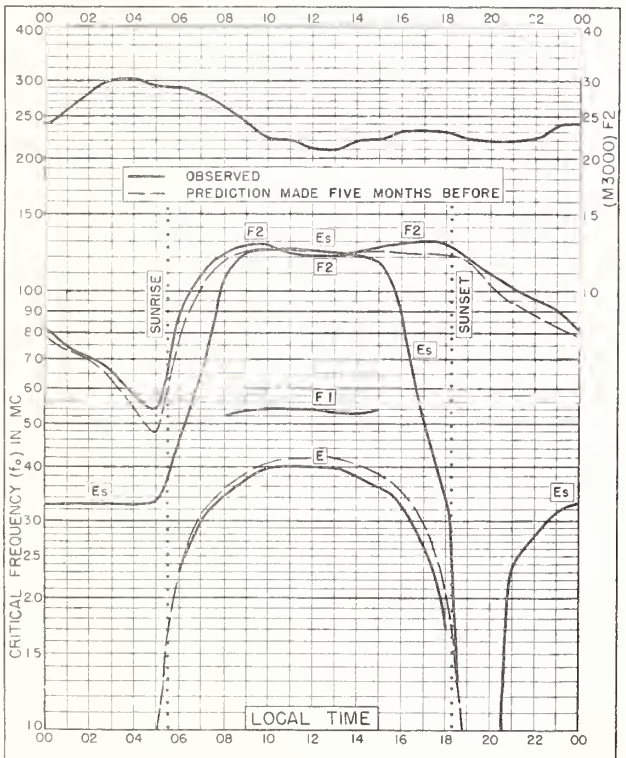

Fig. 23. HUANCAYO, PERU
12.0°S, 75.3°W DECEMBER 1949

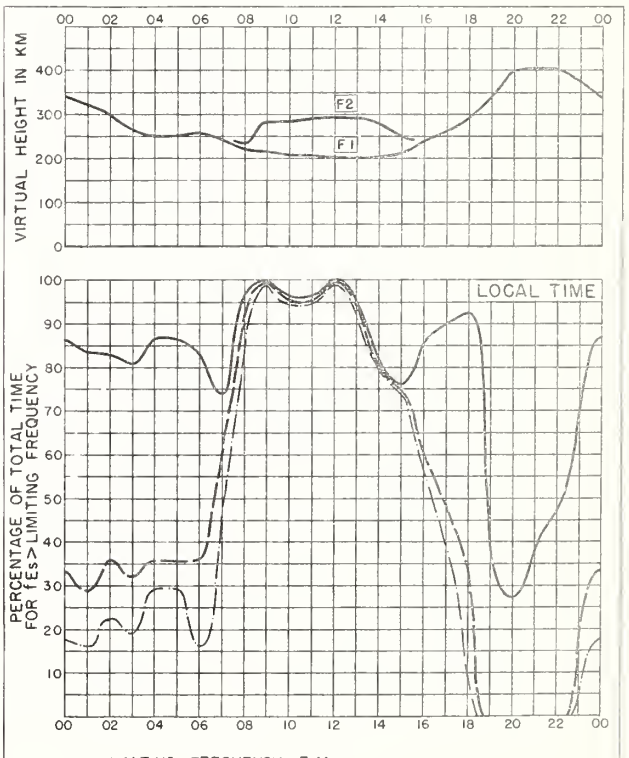

Fig. 24. HUANCAYO, PERU DECEMBER 1949

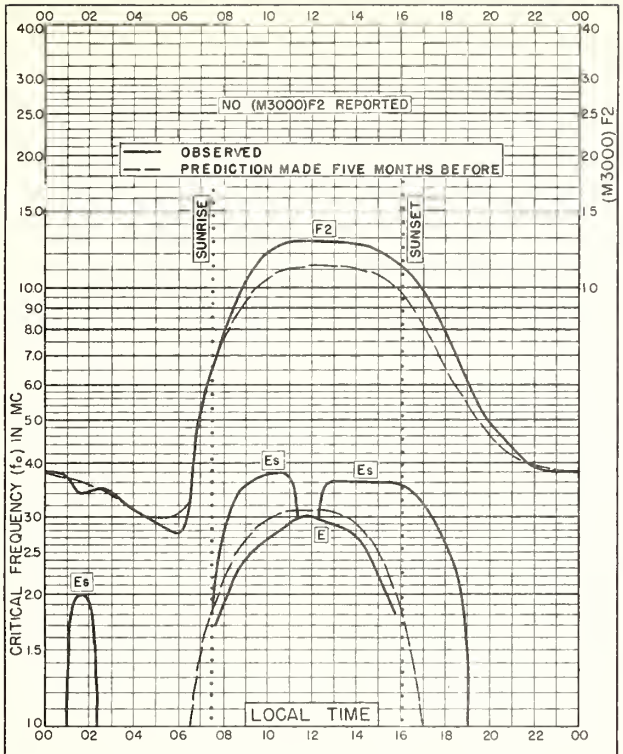

Fig. 25. LINDAU/HARZ, GERMANY
51.6° N, 10.1°E NOVEMBER 1949

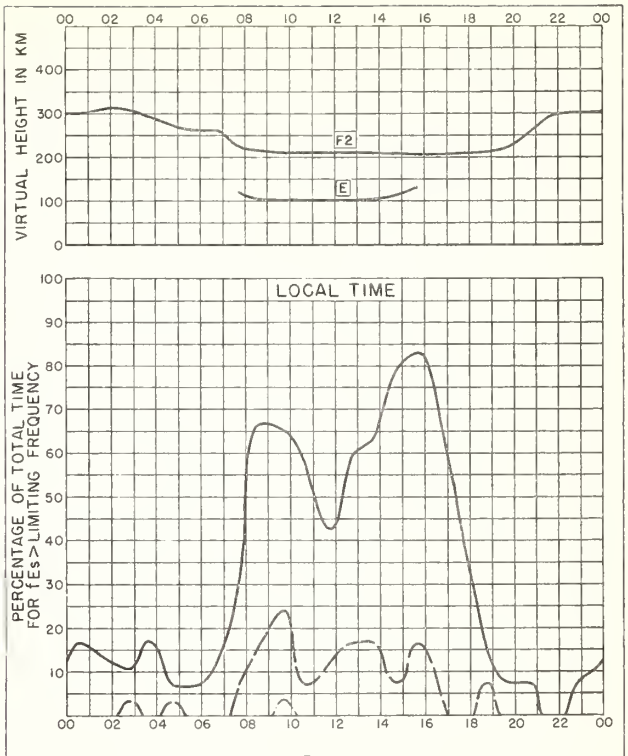

Fig. 26. LINDAU/HARZ, GERMANY NOVEMBER 1949

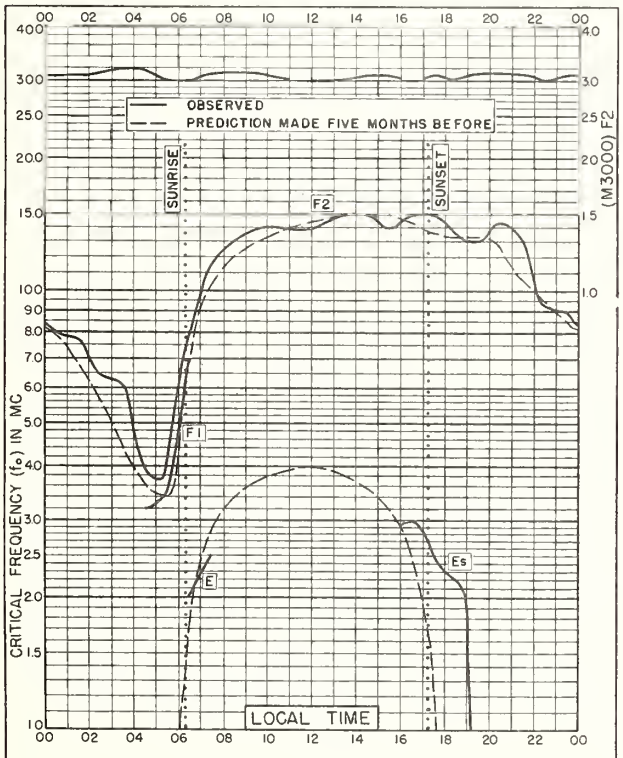

Fig. 27. OKINAWA I.
26.3°N, 127.7°E NOVEMBER 1949

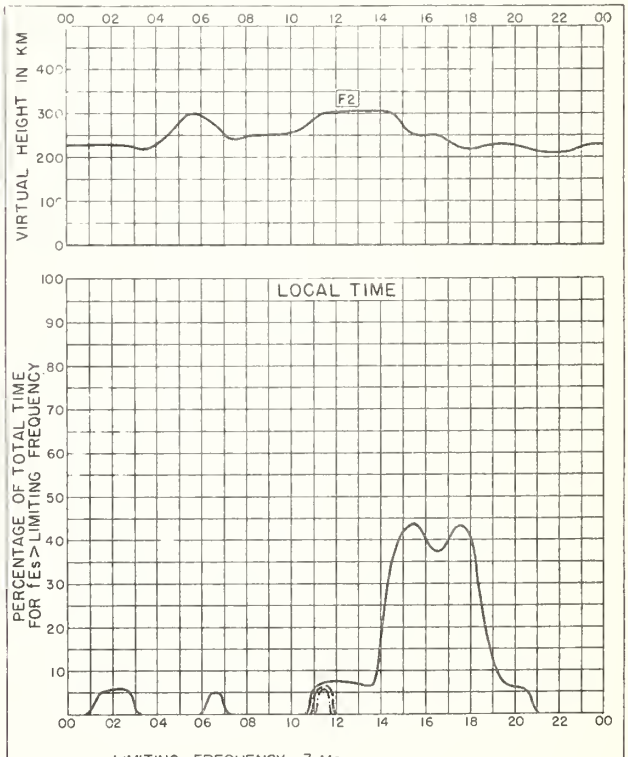

Fig. 28. OKINAWA I. NOVEMBER 1949

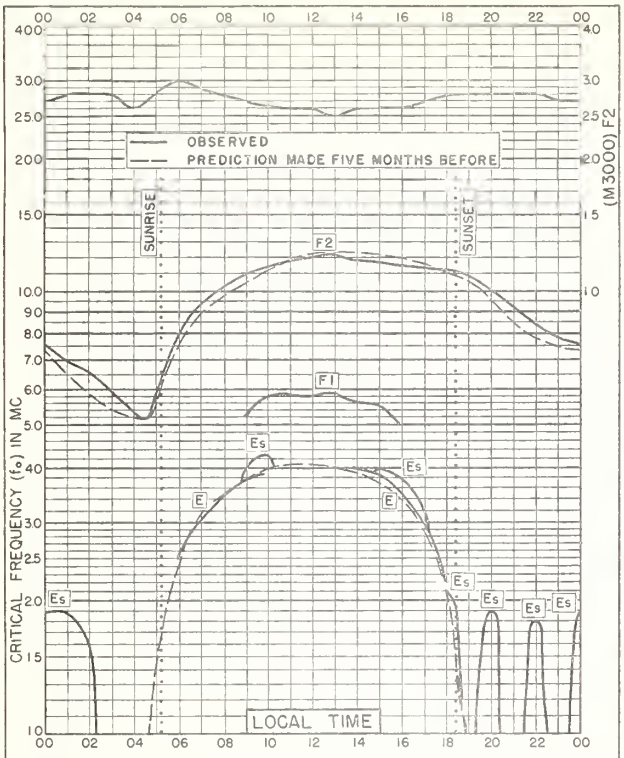

Fig. 29. JOHANNESBURG, U. OF S. AFRICA
26.2°S, 28.0°E NOVEMBER 1949

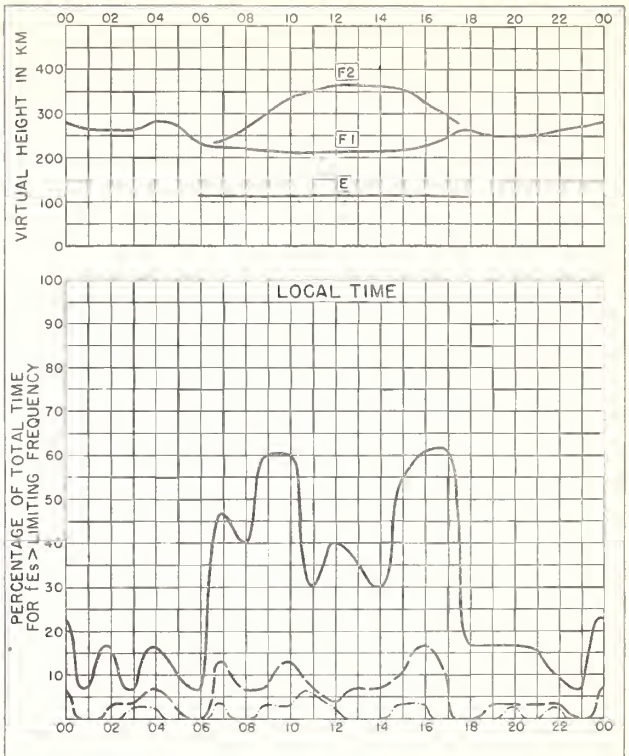

Fig. 30. JOHANNESBURG, U OF S AFRICA NOVEMBER 1949

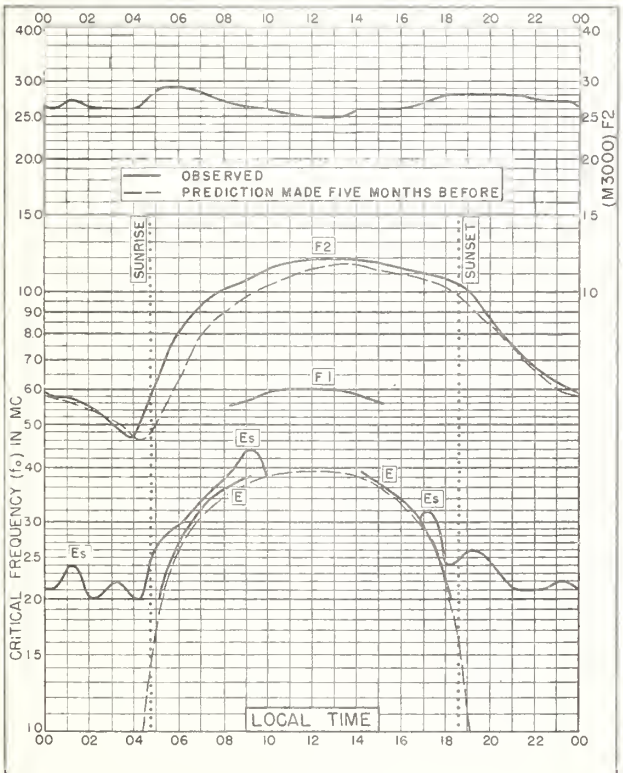

Fig. 31. CAPETOWN, U. OF S. AFRICA
34.2°S, 18.3°E NOVEMBER 1949

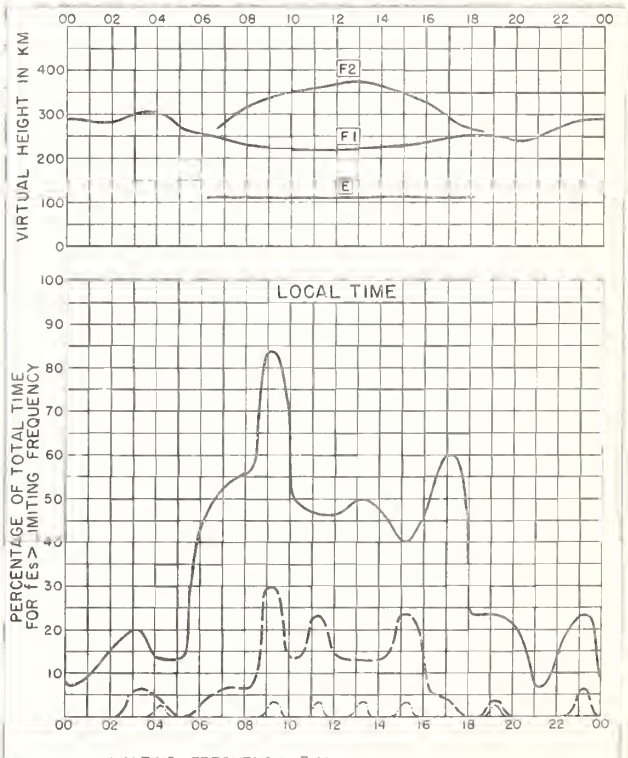

Fig. 32. CAPETOWN, U. OF S. AFRICA NOVEMBER 1949

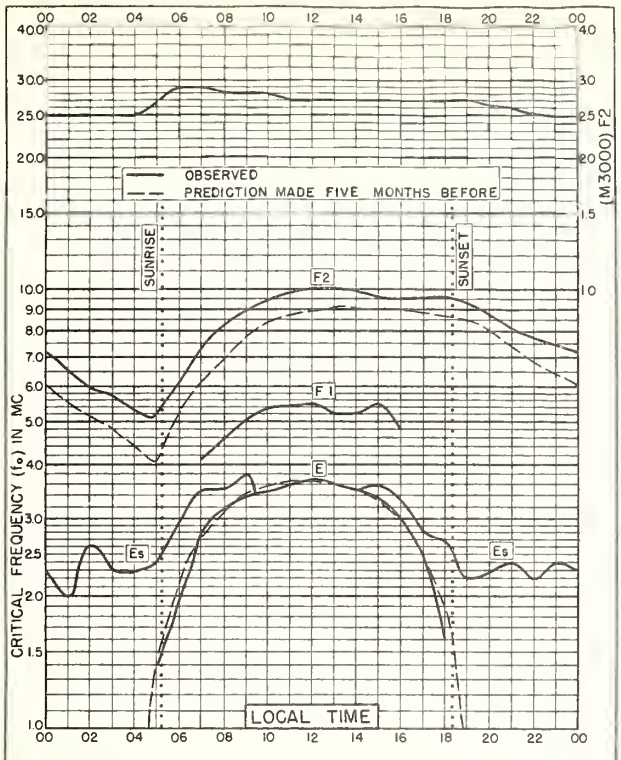

Fig. 33. CHRISTCHURCH, N. Z.
43.5°S, 172.7°E OCTOBER 1949

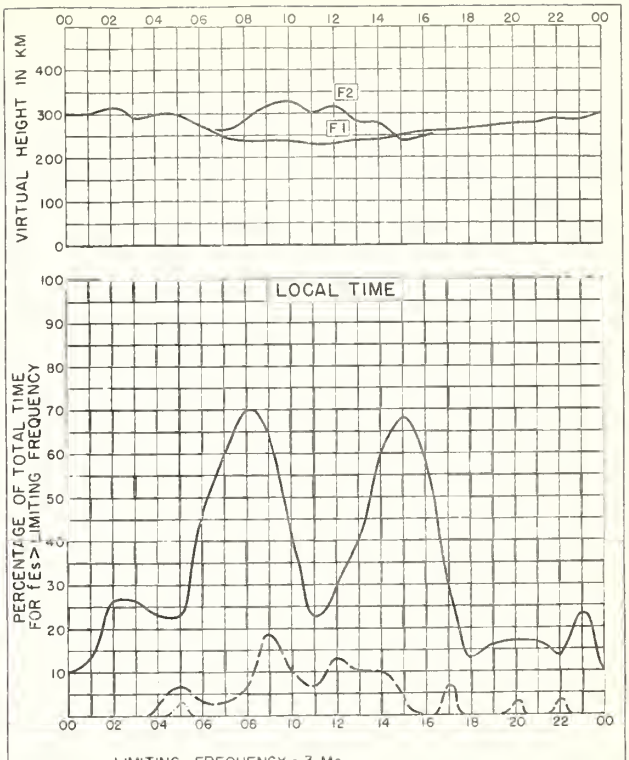

Fig 34. CHRISTCHURCH, N. Z. OCTOBER 1949

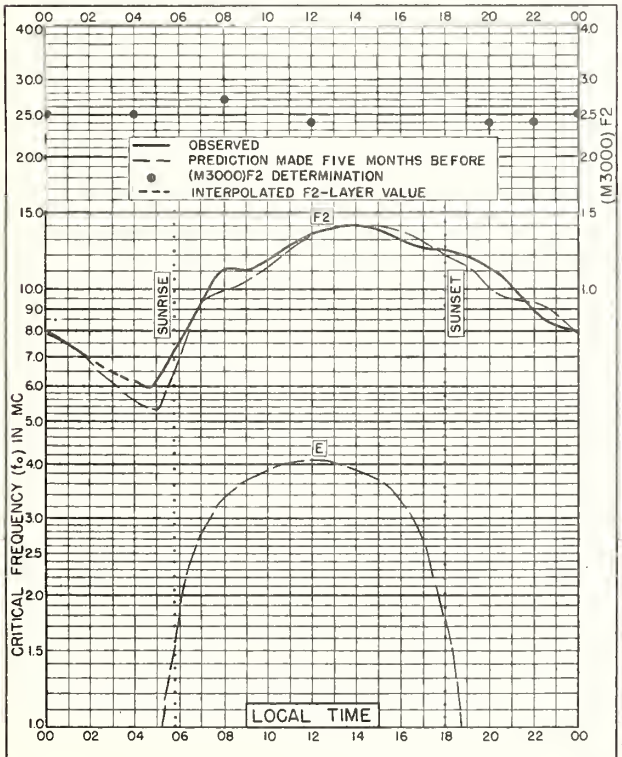

Fig. 35 DELHI, INDIA
28.6°N, 77.1°E SEPTEMBER 1949

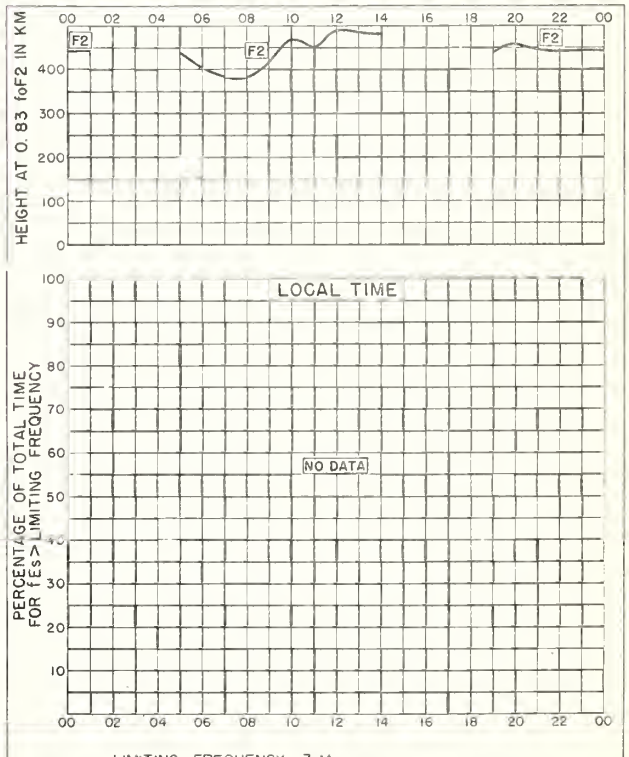

Fig. 36 DELHI, INDIA SEPTEMBER 1949

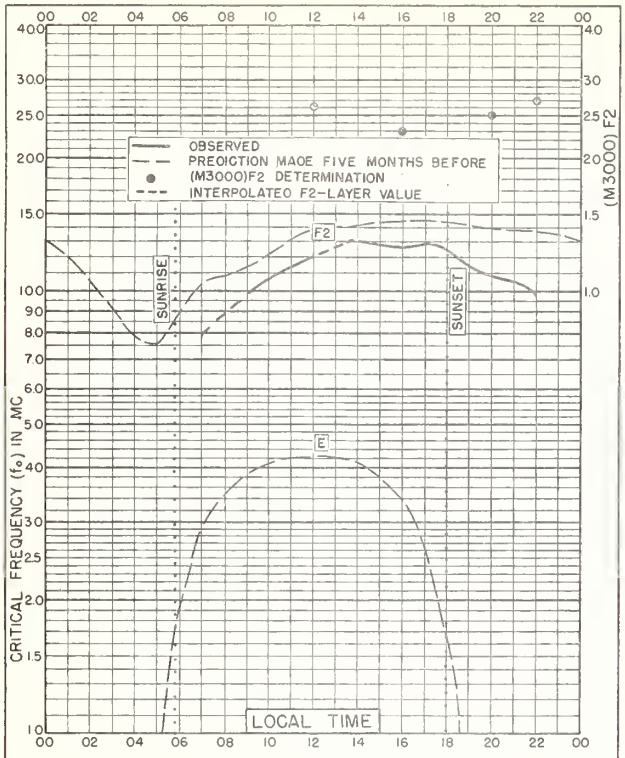

Fig. 37. BOMBAY, INDIA
19.0°N, 73.0°E SEPTEMBER 1949

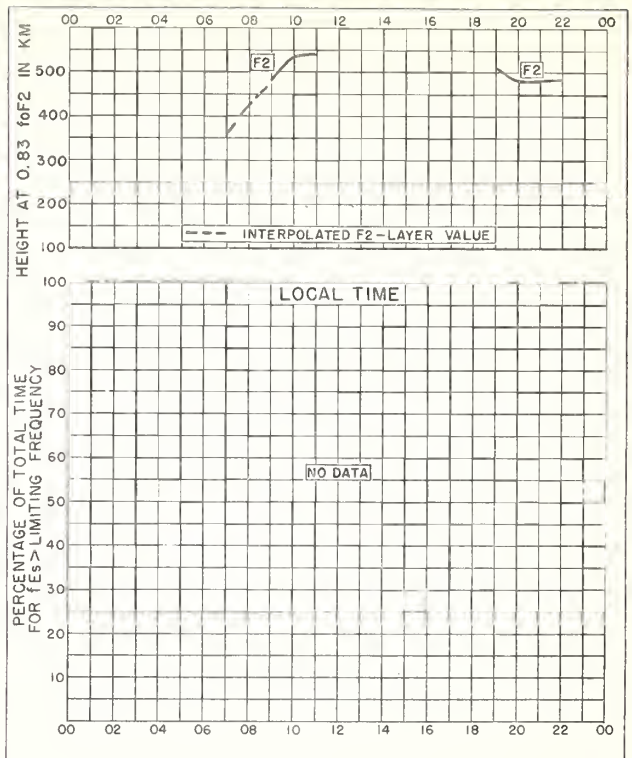

Fig. 38. BOMBAY, INDIA SEPTEMBER 1949

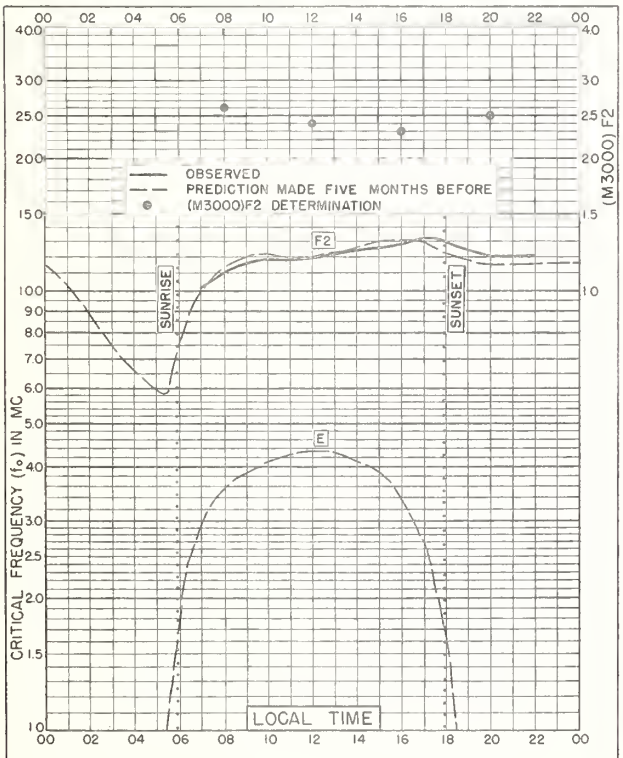

Fig. 39 MADRAS, INDIA
13.0°N, 80.2°E SEPTEMBER 1949

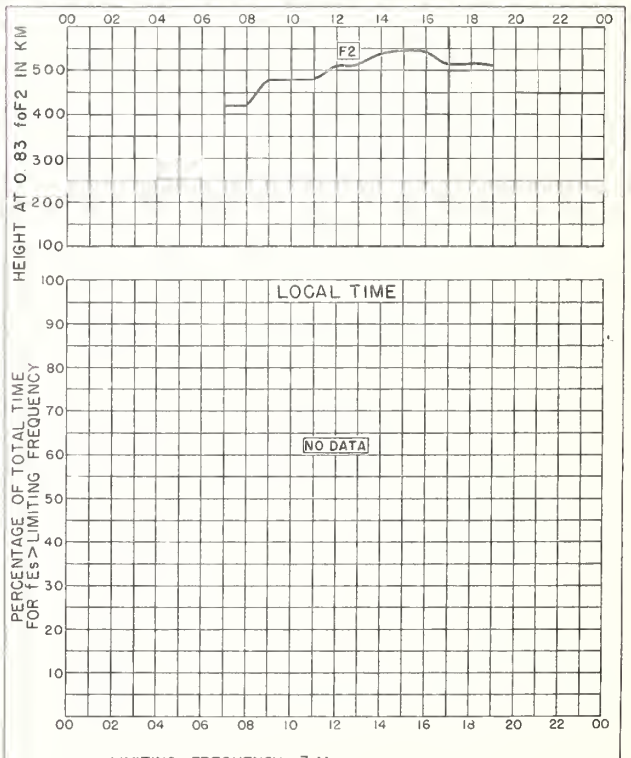

Fig. 40. MADRAS, INDIA SEPTEMBER 1949

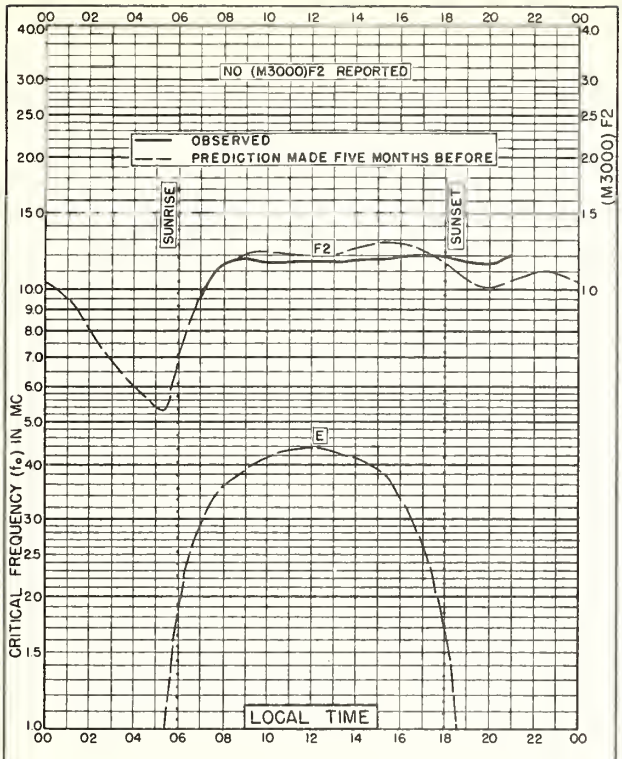

Fig. 41. TIRUCHIRAPALLI, INDIA
10.8°N, 78.8°E SEPTEMBER 1949

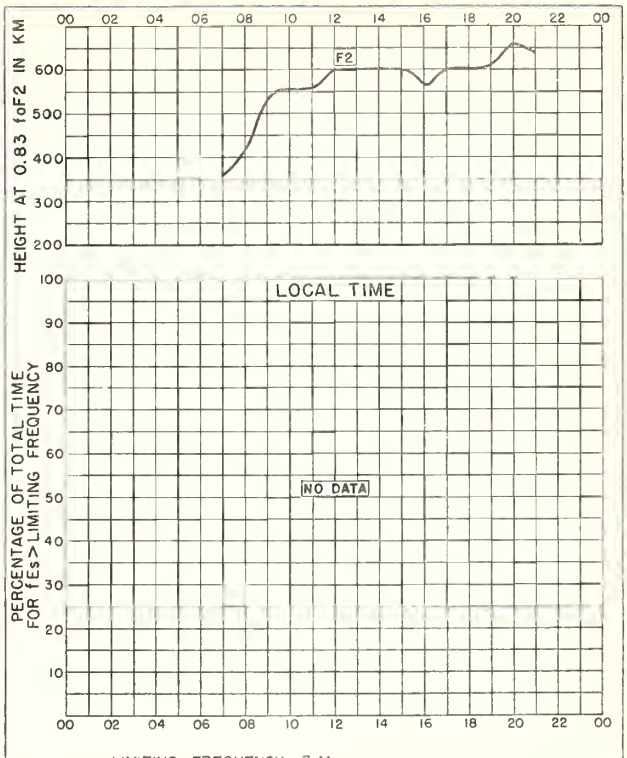

Fig. 42. TIRUCHIRAPALLI, INDIA SEPTEMBER 1949

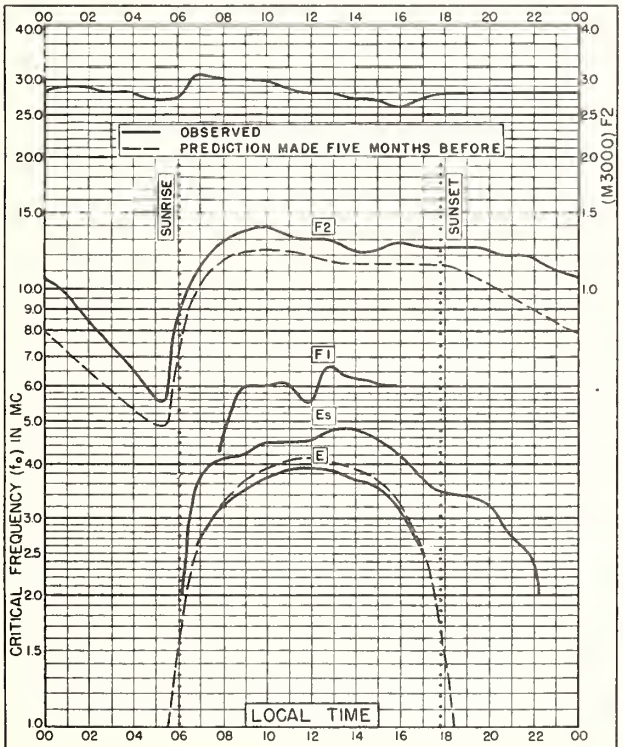

Fig. 43. RAROTONGA I.
21.3°S, 159.8°W SEPTEMBER 1949

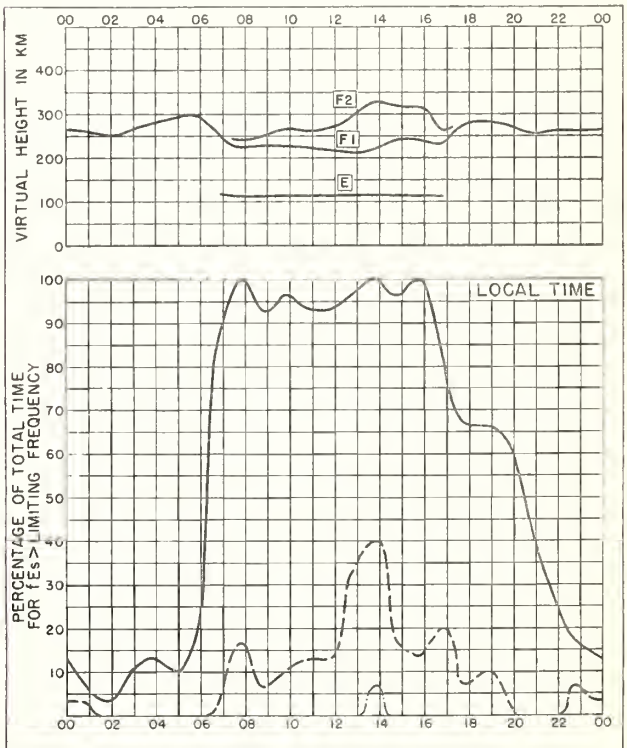

Fig. 44. RAROTONGA I. SEPTEMBER 1949

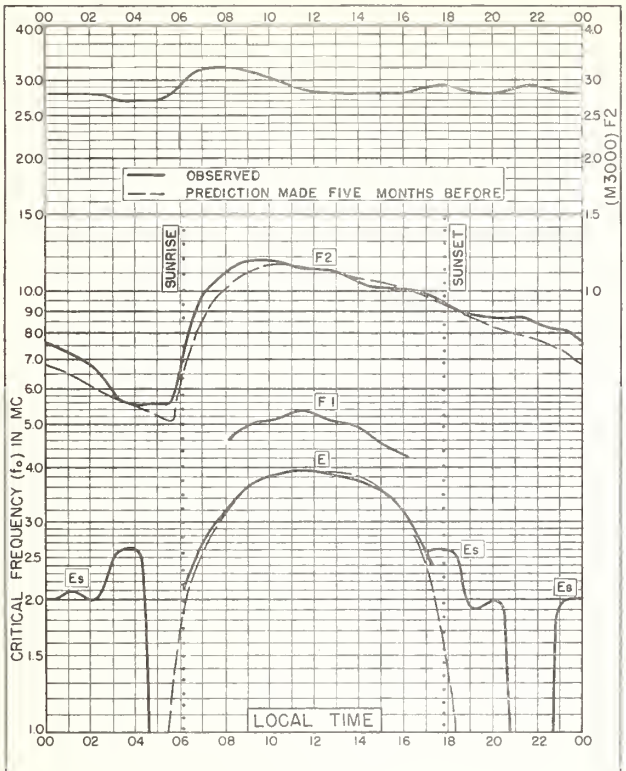

Fig. 45. BRISBANE, AUSTRALIA
27.5°S, 153.0°E SEPTEMBER 1949

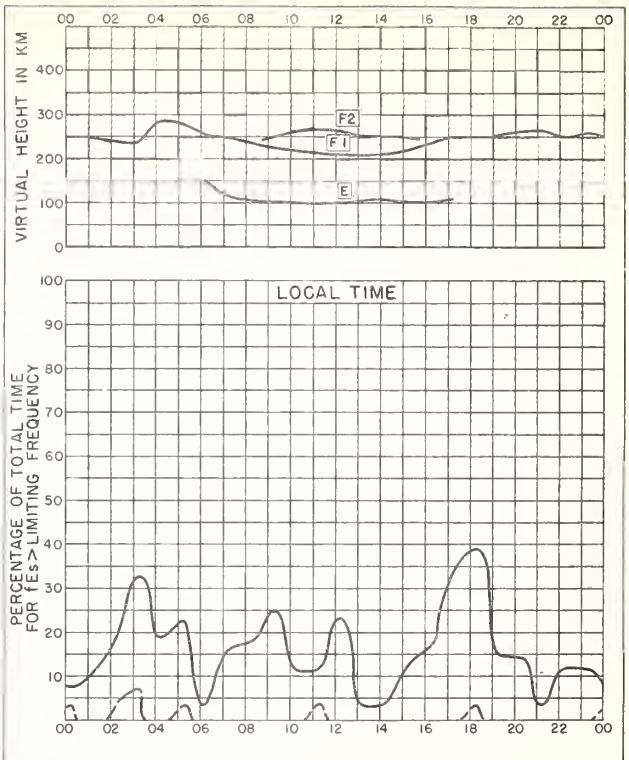

Fig. 46. BRISBANE, AUSTRALIA SEPTEMBER 1949

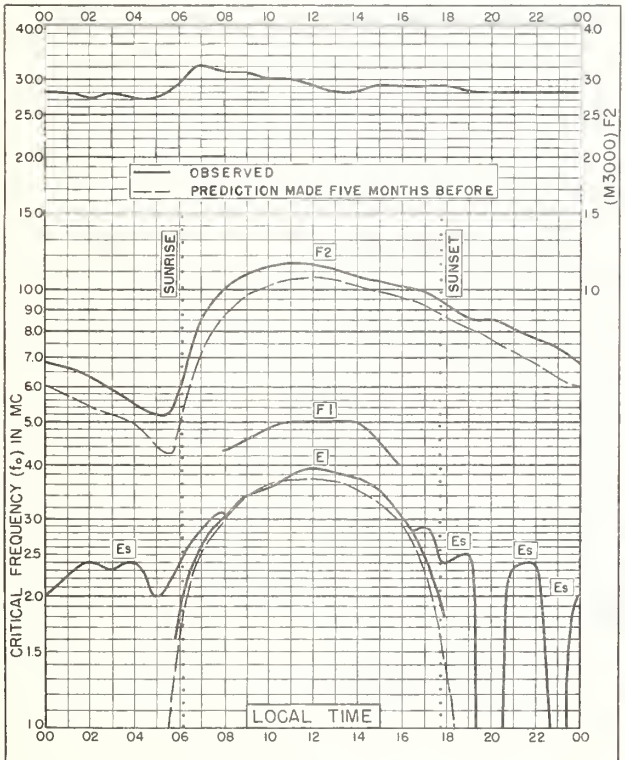

Fig. 47. CANBERRA, AUSTRALIA
35.3°S, 149.0°E SEPTEMBER 1949

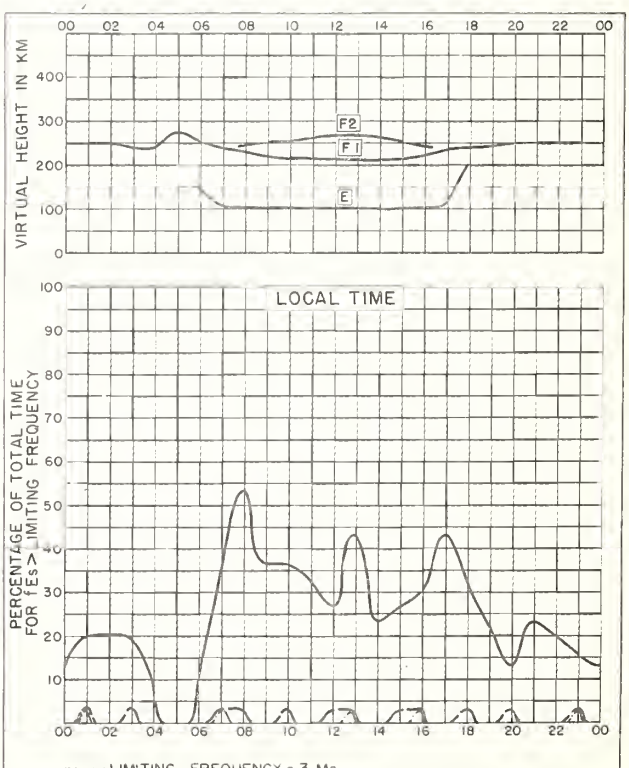

Fig. 48. CANBERRA, AUSTRALIA SEPTEMBER 1949

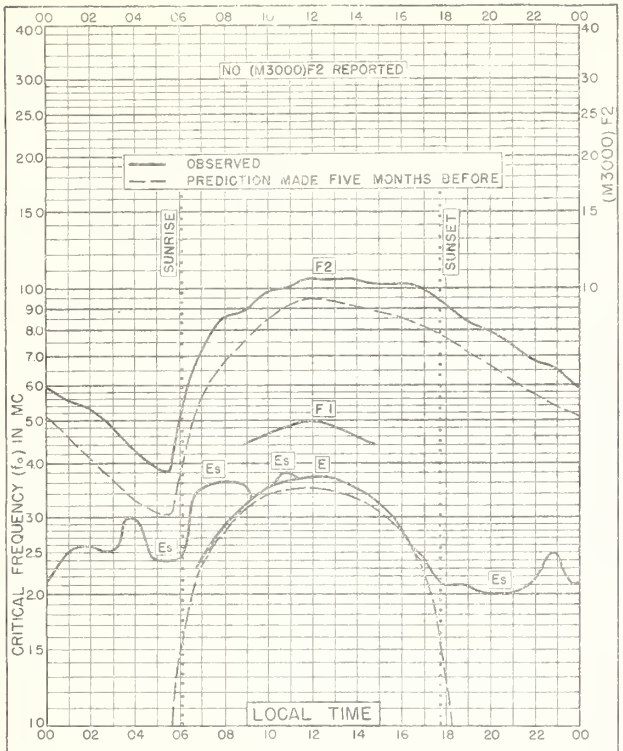

Fig 49 HOBART, TASMANIA
42.8°S, 147.4°E SEPTEMBER 1949

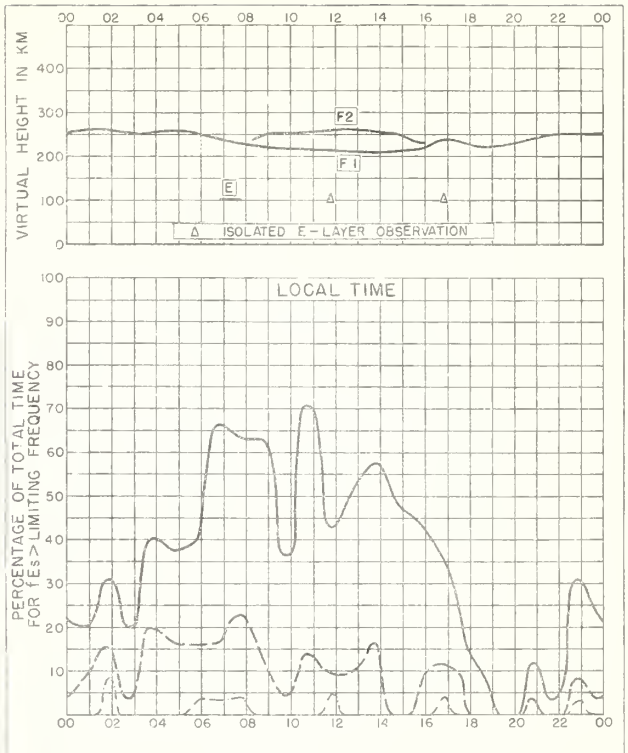

Fig 50 HOBART, TASMANIA SEPTEMBER 1949

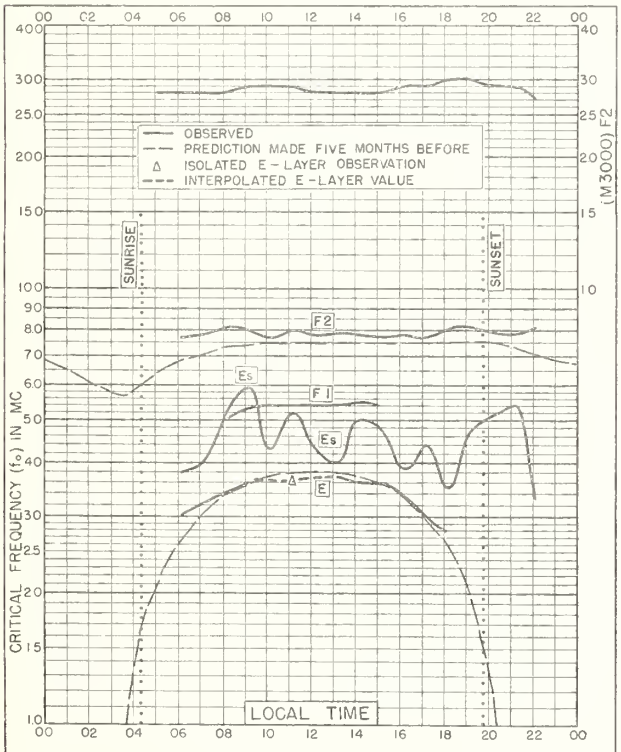

Fig 51. BAGNEUX, FRANCE
48.8°N, 2.3°E JULY 1949

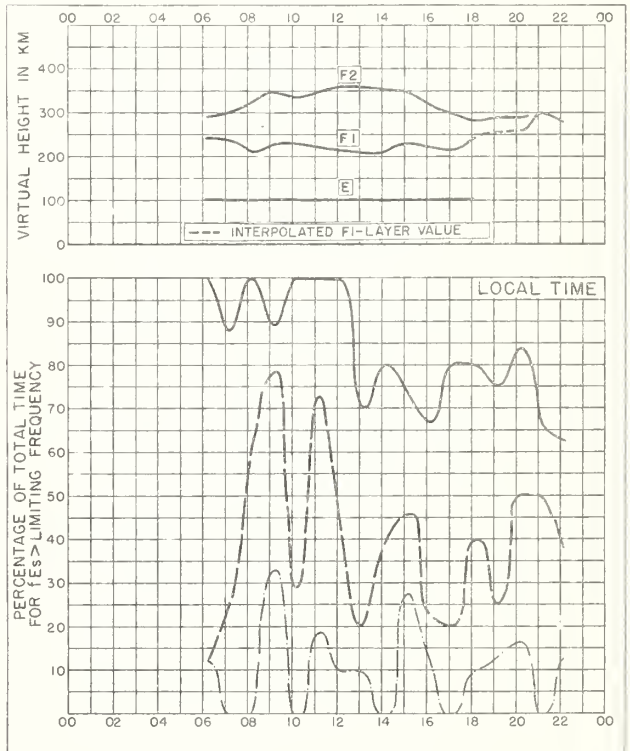

Fig. 52. BAGNEUX, FRANCE JULY 1949

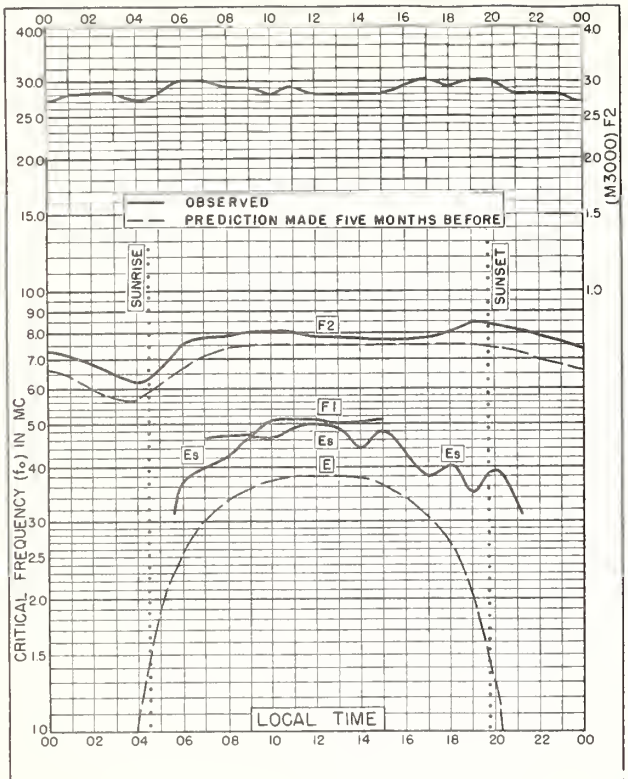

Fig. 53. POITIERS, FRANCE
46.6°N, 0.3°E JULY 1949

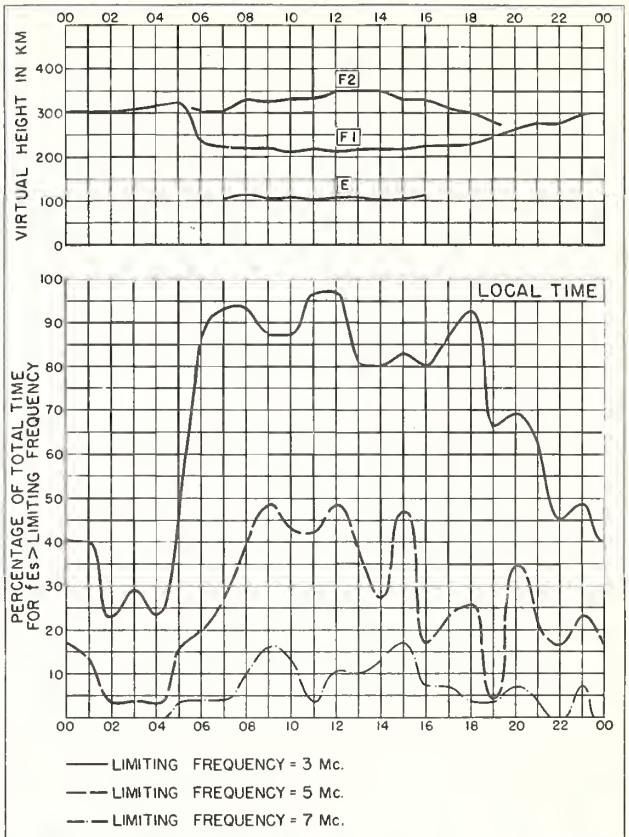

Fig. 54. POITIERS, FRANCE JULY 1949

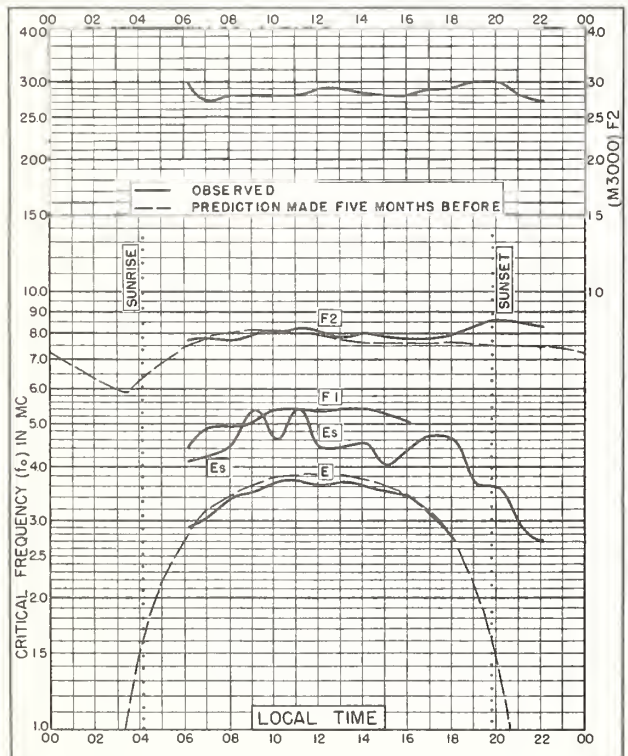

Fig. 55. BAGNEUX, FRANCE
48.8°N, 2.3°E JUNE 1949

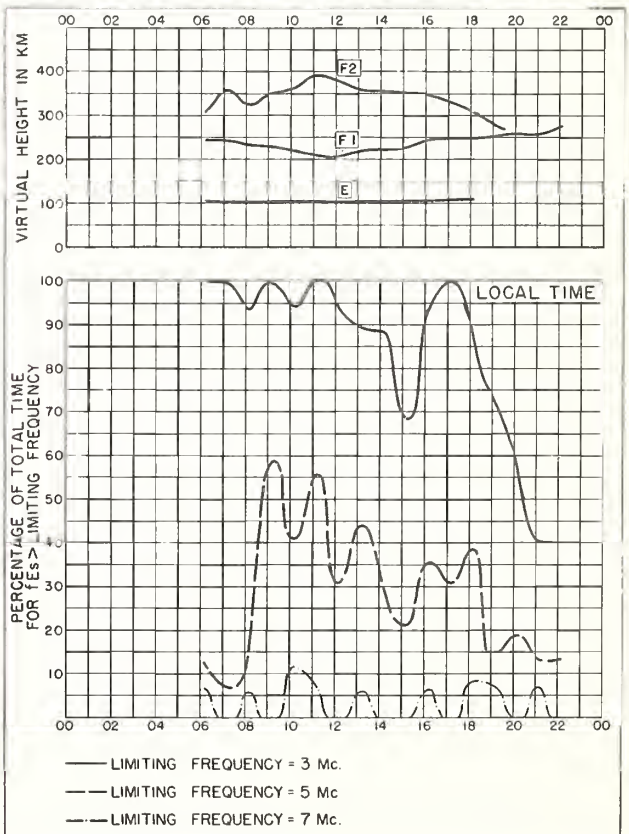

Fig. 56. BAGNEUX, FRANCE JUNE 1949

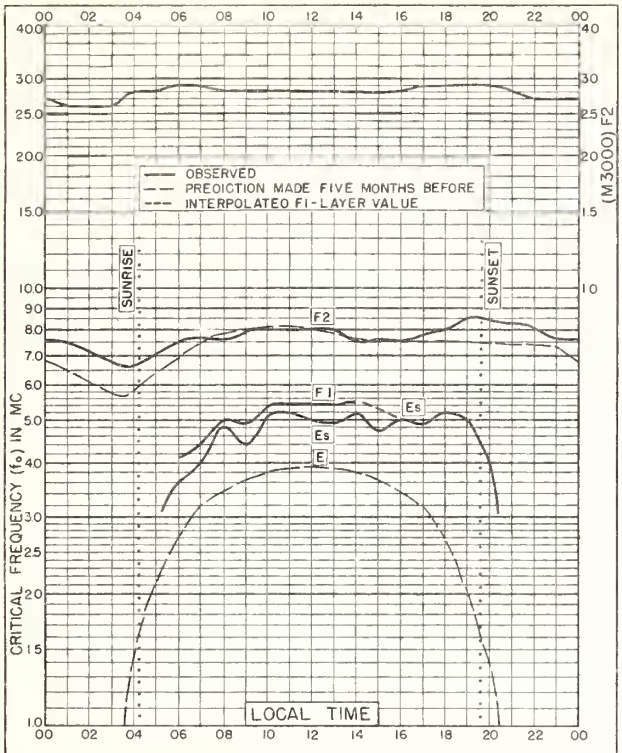

Fig. 57. POITIERS, FRANCE
46.6°N, 0.3°E JUNE 1949

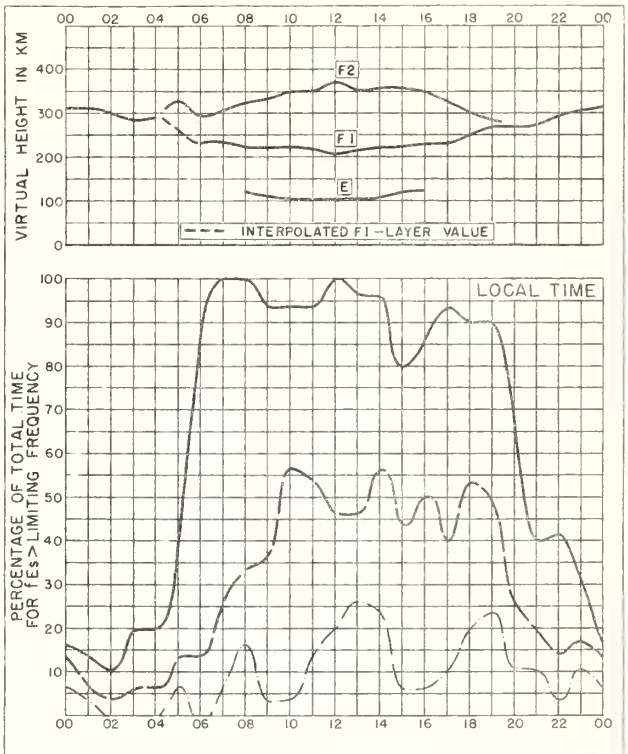

Fig 58. POITIERS, FRANCE JUNE 1949

Index of Tables and Graphs of Ionospheric Data in CRPL-F66

Index (CRPL-F66, continued)

CRPL and IRPL Reports

[A list of CRPL Section Reports is available from the Central Radio Propagation Laboratory upon request]

Daily:

Radio disturbance warnings, every half hour from broadcast station WWV of the National Bureau of Standards.
Telephoned and telegraphed reports of ionospheric, solar, geomagnetic, and radio propagation data.

Weekly:

CRPL–J. Radio Propagation Forecast (of days most likely to be disturbed during following month).

Semimonthly:

CRPL–Ja. Semimonthly Frequency Revision Factors for CRPL Basic Radio Propagation Prediction Reports.

Monthly:

CRPL–D. Basic Radio Propagation Predictions—Three months in advance. (Dept. of the Army, TB 11–499– , monthly supplements to TM 11–499; Dept. of the Navy, DNC–13–1 ( ), monthly supplements to DNC–13–1.)

CRPL–F. Ionospheric Data.

Quarterly:

*IRPL–A. Recommended Frequency Bands for Ships and Aircraft in the Atlantic and Pacific.

*IRPL–H. Frequency Guide for Operating Personnel.

Circulars of the National Bureau of Standards:

NBS Circular 462. Ionospheric Radio Propagation.

NBS Circular 465. Instructions for the Use of Basic Radio Propagation Predictions.

Reports issued in past:

IRPL–C61. Report of the International Radio Propagation Conference, 17 April to 5 May 1944.

IRPL–G1 through G12. Correlation of D. F. Errors With Ionospheric Conditions.

IRPL–R. Nonscheduled reports:

- R4. Methods Used by IRPL for the Prediction of Ionosphere Characteristics and Maximum Usable Frequencies.
- R5. Criteria for Ionospheric Storminess.
- R6. Experimental Studies of Ionospheric Propagation as Applied to the Loran System.
- R7. Second Report on Experimental Studies of Ionospheric Propagation as Applied to the Loran System.
- R9. An Automatic Instantaneous Indicator of Skip Distance and MUF.
- R10. A Proposal for the Use of Rockets for the Study of the Ionosphere.
- R11. A Nomographic Method for Both Prediction and Observation Correlation of Ionosphere Characteristics.
- R12. Short Time Variations in Ionospheric Characteristics.
- R14. A Graphical Method for Calculating Ground Reflection Coefficients.
- R15. Predicted Limits for F2-Layer Radio Transmission Throughout the Solar Cycle.
- R17. Japanese Ionospheric Data—1943.
- R18. Comparison of Geomagnetic Records and North Atlantic Radio Propagation Quality Figures—October 1943 Through May 1945.
- R21. Notes on the Preparation of Skip-Distance and MUF Charts for Use by Direction-Finder Stations. (For distances out to 4000 km.)
- R23. Solar-Cycle Data for Correlation with Radio Propagation Phenomena.
- R24. Relations Between Band Width, Pulse Shape and Usefulness of Pulses in the Loran System.
- R25. The Prediction of Solar Activity as a Basis for the Prediction of Radio Propagation Phenomena.
- R26. The Ionosphere as a Measure of Solar Activity.
- R27. Relationships Between Radio Propagation Disturbance and Central Meridian Passage of Sunspots Grouped by Distance From Center of Disc.
- R30. Disturbance Rating in Values of IRPL Quality-Figure Scale from A. T. & T. Co. Transmission Disturbance Reports to Replace T. D. Figures as Reported.
- R31. North Atlantic Radio Propagation Disturbances, October 1943 Through October 1945.
- R33. Ionospheric Data on File at IRPL.
- R34. The Interpretation of Recorded Values of *fEs*.
- R35. Comparison of Percentage of Total Time of Second-Multiple *Es* Reflections and That of *fEs* in Excess of 3 Mc.

IRPL–T. Reports on tropospheric propagation:

- T1. Radar operation and weather. (Superseded by JANP 101.)
- T2. Radar coverage and weather. (Superseded by JANP 102.)

CRPL–T3. Tropospheric Propagation and Radio-Meteorology. (Reissue of Columbia Wave Propagation Group WPG–5.)

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